

THE UNIVERSITY IN THE TWENTY-FIRST CENTURY



Teaching the
New Enlightenment
in the Digital Age

YEHUDA ELKANA AND HANNES KLÖPPER
EDITED BY MARVIN LAZERSON

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HANNES KLÖPPER

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“Que sçais-je?”

MONTAIGNE

*Dedicated to Yehuda Elkana (1934–2012):
philosopher of science, intellectual, lover of the arts and
music, professor, university president and rector, mentor,
husband, father, grandfather, and beloved friend.*

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Preface

The Enlightenment cluster of values, which saw knowledge as rational and all-embracing, that evolved in linear and predictable ways, and was measurable, context-independent and coherent led to extraordinary solutions to scientific, social and economic problems. That cluster, however, has exhausted itself. It no longer, Yehuda Elkana and Hannes Klöpper argue, describes a reality that is complex, messy, non-linear, context-dependent and unpredictable. The consequences of this reality for education and especially higher education are momentous, even revolutionary

In a series of wide-ranging chapters, Elkana and Klöpper explain why and how universities have to respond if they are to retain any meaningful role in a world that desperately needs to be better understood and requires more knowledgeable and concerned citizens. New curricula have to be created that combine rigorous disciplinary skills and immersion in the most critical problems the world faces. Learning and research need to center on such questions as: Is there one form or many forms of democracy? How can epidemics be contained or even eliminated? What economic theories can cope with poverty and hunger in dramatically different societies? How do differing values and technologies affect our environments?

To answer such questions, Elkana and Klöpper make clear that the traditional dichotomy between universities, which focus on theoretical knowledge and basic research, and technical and professional schools, which are about practical applications, is no longer viable. Admirably, they provide examples of how universities can and are bringing together theoretical considerations and real-life situations.

What follows from the questions and innovations is a new orientation that focuses on how universities can provide incentives and teach skills that will

expand the realm of knowledge, provide creative and sound information to solve complex problems, and foster critical thinking and concerned citizenship that should be central to their mission. To accomplish all of this will not be easy. But not to try, Elkana and Klöpper believe, would be a tragedy.

LIVIU MATEI
Provost and Professor,
Director, Yehuda Elkana Center on Higher Education,
Central European University

Foreword

This book is a collaborative effort between two partners: one experienced and seasoned veteran, the other an energetic young novice.

The one partner brings to the project worldly experience through years of academic work and the management of various academic institutions. The other brings the bold and audacious drive of a young bricoleur who not only has an interdisciplinary educational background but also a deep understanding of the digital world in which we live.

We address below the broad spectrum of challenges confronting the university of the 21st century. We place special emphasis on the questions regarding the very idea and purposes of universities, especially as viewed through curriculum and pedagogy, what is taught and how it is taught. The ideas recommended here for reform concern especially undergraduate or Bachelor degree programs in all areas of study, from the humanities and social sciences to the natural sciences, the technical fields, and to law, medicine, and other professions. We believe these principles should be at work at all levels of higher education, including doctoral education.

We have chosen to shed light on the historical and intellectual context of higher education's problems and to help set in motion a broad societal debate on possible solutions. The form we have chosen for this undertaking, that of a collection of normative essays stretching though time and space as the basis for implementing the reforms we urge..

The core thesis of this book rests on the emergence of a "New Enlightenment," which requires a revolution in curriculum and teaching in order to translate the academic philosophy of global contextualism into universal practice or application. Comprehensive reform with this in mind means no less than a revolution in the history of thought. The university as

an institution is asked to revamp teaching in order to impart a new understanding of knowledge to students so as to foster critical thinking that would serve them their entire lives.

This book calls for universities to become truly integrated rather than remaining collections of autonomous agencies more committed to competition among themselves than cooperation in the larger interest of learning. It calls for curricula that take as its centerpiece the complex and messy world we live in as the prerequisite of preparing knowledgeable citizens. It calls for teaching and learning that takes full advantage of the opportunities offered by digital technology rather than acting as if the technology was simply a technical tool with little relevance to academic learning. If we are able to persuade the reader of the importance of these changes, the book will have succeeded in its aims.

Yehuda Elkana: I would like to thank the Board of Trustees of the Central European University (CEU) for their generous support after my retirement as President and Rector of the university. I would also like to thank the Wissenschaftskolleg in Berlin, the Max Planck Institute for the History of Science in Berlin and the Jacobs University Bremen. I dedicate this book to my family: to my wife Yehudit and my children and grandchildren.

Hannes Klöpper: My thanks go first and foremost to Yehuda for his enormous trust. His openness, his intellectual curiosity and his warmth of spirit have made this collaborative project possible. These are the characteristics that make me proud to call him my friend and mentor. I would also like to thank my family and especially my parents who have supported me over the years in every way possible, even when the results of my actions were not always clear to predict.

Marvin Lazerson: The original manuscript was completed before Yehuda Elkana died in 2012 and was published in German as *Die Universität im 21. Jahrhundert: Für eine neue Einheit von Lehre, Forschung und Gesellschaft* (Körber Stiftung, 2012). I edited the English translation for Central European University Press, in what was an extraordinary intellectual adventure.

The following people helped to make this a better book:

Angelique Emmermann, Anthony Kerr, Bill Sullivan, Erika Otto, Günter Stock, Hans Weiler, Helga Nowotny, Isabell Trommer, Jan Barth, Jo Ritzen, Lee Shulman, Markus Steinmayr, the staff at the Körber-Stiftung, Nicolas von Kalm, Patricia Graham, Ralph Müller-Eiselt, Sally Humphreys, Sebastian Hirsch, Sebastian Litta, and Ugo Pagano.

CHAPTER I

INTRODUCTION

The world is complex and messy and always has been. Yet, this realization must first gain acceptance. Since the Enlightenment, our understanding of knowledge was defined by the idea of creating knowledge in all areas as if the world were predictable, context-independent, coherent, linear and as if—in the end—all knowledge would be reducible to a few, universal formulae.

Moreover, the Enlightenment was committed to the belief that there is strict compatibility between the world of nature and the world of human society, the “cosmos” and the “polis,” called by some scholars the “cosmopolis.” As a result of this daring assumption, an unprecedented richness of knowledge was created in the natural sciences, the social sciences and in the humanities. For a long time the Enlightenment presupposition that one could study nature and society in abstract terms—as if they were linear, predictable, context-independent, coherent and simple—did produce new knowledge and solutions to many pressing social problems. This is not so anymore. The Enlightenment program has exhausted itself and no longer delivers according to our expectations.

The paradigms of the Enlightenment began to crumble under the weight of new knowledge created in the 20th century that highlighted that the world is neither linear nor coherent, neither free from contradictions nor reducible to a few formulae; that it is ultimately context-dependent, messy, even unpredictable. It became increasingly clear that the cherished universals of the Enlightenment were in fact local, Western universals.

Thus in our opinion we need no less than a “New Enlightenment” based on the principle “from local universalism to global contextualism,” which stems from the idea that interpreting knowledge is never value-free nor

independent of context. It requires greater emphasis on reasonableness, commonsense, pragmatism, and real-life situations. It is especially important to understand non-linear phenomena in all areas of knowledge, as most phenomena we encounter are of a non-linear type. These cannot be described by straight causal relations, are not strictly predictable and cannot be expressed mathematically in simple differential equations. In linear systems the whole is precisely equal to the sum of its parts. When the whole amounts to much more than the sum of its parts, the mathematical expression of this state is in non-linear equations, one whose graph is not a straight line but a kind of curve.

This “New Enlightenment” must find its expression in higher education curricula, as the university is the only social institution established for the purposes of creating new knowledge and passing it on to future generations.

Is this nothing but a naive hope? We do not think so. The social contract between society and universities, however, will have to be reformulated in a way that acknowledges even more clearly the quality of education as a public good.

What We Are Up Against

In 1930, Abraham Flexner, the well-known reformer of medical school education, exclaimed the following: “I propose ... to ask myself to what extent and in what ways universities in America, in England, and in Germany have made themselves part of the modern world, where they have failed to do so, where they have made hurtful concessions, and where they are wholesome and creative influences in shaping society towards rational ends” (Flexure 1930, 3).

We shall discuss the different stages of development starting with Cardinal Newman’s Oxford-inspired College, Wilhelm von Humboldt’s German University, Abraham Flexner’s Modern Research University (the Humboldtian model, as exemplified by Johns Hopkins University in the late-nineteenth century United States), Clark Kerr’s multiversity of the 1960s, culminating in the fractured, partially commercialized universities of the globalized world we live in today.

The university is arguably one—if not the—most conservative social institution we know (except for, maybe, the Catholic Church and some royal

family dynasties). Yet, at the same time, it is also one of the most enduring. In spite of a sea of changes and innovations in the world around it, the basic structure of the university has not changed much since its inception in the late Middle Ages. The core features remain; the basic actors are the same; no matter where or in what age, the challenge remains to educate concerned, well-informed citizens.

An illustration of this conservative spirit is found in the famous 1908 work entitled “Microcosmographia Academica,” a piece of satirical advice to the young academic politician. (Cornford 1908) As quoted in Clark Kerr’s *The Uses of the University* (2001, 10, 22, 23):

- 1) “... nothing is ever done until everyone is convinced that it ought to be done, and has been convinced for so long that it is now time to do something else.”
- 2) “There is only one argument for doing something; the rest are arguments for doing nothing.”
- 3) “It follows that nothing should ever be done for the first time.”

A typical characteristic of the vast literature discussing the malaise of the academy is that most sources abstain from even trying to give normative or practical recommendations as to what should be done.

Jürgen Kaube, the knowledgeable journalist and notorious skeptic in charge of the cultural section (the *Feuilleton*) of the *Frankfurter Allgemeine Zeitung* and expert on higher education in Germany, as well as ardent critic of recent reform initiatives in higher education, has edited a small book entitled *Die Illusion der Exzellenz: Lebenslügen der Wissenschaftspolitik* (2009), roughly “The illusion of excellence: The grand delusion of science policy.” In addition to Kaube’s excellent Foreword and his concluding chapter, there are seven interesting contributions by German professors from various universities. All of these essays are clearly written, insightful diagnoses of the malaise. And yet there is one thing they do not do: they do not make any viable suggestions as to what would be better, or what might be alternative ways of solving the problems the Bologna reforms have sought to address.

One specific problem, which is rarely mentioned in spite of the fact that it has existed for a long time, is the textbook tradition. Francis Bacon described it already in 1603:

The branches of knowledge we possess are presented with too much pretension and show. They are dressed up for the public view in such a way as to suggest that the individual arts are one and all perfected in every part and brought to their final development. Their methodical treatment and their subdivisions suggest that everything that could fall under the subject is already included. Branches of knowledge which are poorly nourished and lacking in vital sap make a show of presenting a complete whole and the few treatises not always even selected from the best authors come to be accepted as complete and adequate accounts of their subjects... Nowadays the sciences are presented in such a way as to enslave belief instead of provoking criticism. (Farrington 1970, 75)

Important as it is to point out the flaws of the status quo, society cannot stop there. Our purpose is not only to criticize. The only way to proceed is to be unashamedly normative and to make daring proposals, if for no other reason than at least to instigate an in-depth, practical dialogue. This is the goal of our book.

The Difficulty of Comprehensive Curriculum Reform

In his book *Marketplace of Ideas: Reform and Resistance in the American University*, Louis Menand (2010, 16) comes to the conclusion that the fields within the Liberal Arts, after years of ongoing turf wars between those for the freedom to choose and those for a core curriculum, have increasingly lost sight of a common purpose, or goal.

Instead, the opposition to anything that seemed remotely practical or vocational emerged as the lowest common denominator. Since most of the reform proposals evolved out of dissatisfaction with the abstract theorizing that had taken hold of universities' classrooms and instead pointed in the direction of making students think about life beyond the campus gates, they were typically met with either indifference or hostility on the part of the faculty.

Those who espouse academic seriousness object to skipping rigorous, technically high-level introductory courses and abhor introducing real-life situations early on. According to the standard academic mantra, broad interdisciplinary knowledge and in-depth technical expertise are necessary for students so that they may deal with problems as they exist in the real

world in an academic context—a knowledge and an expertise that most students will in fact never acquire, certainly not during the course of their Bachelor's degree. On a cognitive level, professorial opposition to initiatives introducing non-rigorous, 'superficial' teaching into the academy is defended in order to maintain and preserve high academic standards. This is one of the favorite arguments of conservative academics.

And yet it is this avoidance of real-life situations and the focus on rigorous, in-depth, technically high-level introductory courses—which are typically not related to relevant real-life situations—that cause our students to dropout physically as well as intellectually. The percentage of students who drop out of a university program is high. And many of those who do successfully complete a university degree program do so without ever developing a true zeal or eagerness for their area of study. Hence, reform efforts aimed at reducing the number of university dropouts as well as the number of students who bide their time in order to get their diploma are urgently needed.

Menand makes the insightful remark that “The divorce between liberalism and professionalism as educational missions rests on a superstition: that the practical is the enemy of the true. This is nonsense.” Moreover, “Almost any liberal arts field can be made non-liberal by turning it in the direction of some practical skill...” and less obviously “... any practical field can be made liberal simply by teaching it historically and theoretically” (*ibid.*, 56–57).

The Problems of Contemporary Higher Education

1) While the world of higher education is in turmoil, most of the analysts and actors in positions of responsibility look almost exclusively at issues of structure, budgets, evaluation, assessment and accountability. They are basically putting the cart before the horse. Our universities should first establish their curricular mission, before they address the administrative issues that flow from this mission. To put it in the overused design mantra: form should follow function. The preoccupation with tweaking rather than innovating is a widespread phenomenon in the socio-political world more generally, but it is a weakness that must be overcome in order to implement meaningful, that is, transformative change in the field of higher education.

2) A critical problem is the emphasis placed on research, which is typically due to a shortsighted economic rationale, such as that spurred on by the

excellence initiatives in Germany. In fact, a maximum of 5% of the student population is involved in research. And as far as serious research goes, we are probably also not talking about more than 5% of the faculty members either.

3) It is rarely recognized that a serious preoccupation with the remaining bulk (95%) of the student body is not only a question of social fairness—which it is—but also a condition *sine qua non* for the select few who do go on to do research (the 5%), as it allows them to enjoy a high quality general education that would better prepare them for coping with our complex and messy world—intellectually as well as morally. The small segment destined to do serious research thus should share in a basic education with the rest of the student population who will leave the university after finishing a Bachelor's program.

4) With the exception perhaps of very few highly endowed private institutions, primarily in the United States, universities as we know them are unable to provide the kind of higher education we envision with the funds at their disposal. This is evidenced by a number of indicators: faculty/student ratios; expenses per student; the size of lecture classes and seminars. The numbers grow as more and more students (young and mature) seek university degrees, while the available funds at best remain the same and more shrink as a proportion of the student body. The circumstances vary, but by and large the situation at most European universities is a disaster. The hundreds of new universities currently springing up in India and China typically fare even worse.

5) Money alone would not solve our universities' problems. What is even more problematic, and indeed more damaging than persistent budget shortages (although the problems may well be related), is that most universities, worldwide, do not spend enough time and effort on re-evaluating their aims in different contexts and do not prepare relevant new curricula. As a result, today's universities do not prepare undergraduates: a) for coping with life in the 21st century; b) for research; c) for entering the professional world, as practical perspectives are sorely neglected at most universities and not satisfactorily handled even by specific professional schools, be it in the areas of medicine, law, engineering, business, nursing, public policy, teaching, the seminary or others.

6) The most jarring neglect is found in educating students to become 'concerned citizens' in the moral, but even more importantly, cognitive sense. A concerned citizen, in the cognitive sense, must be conscious of the major

problems that confront humanity today, must be aware of the limitations of our existing intellectual tools in coping with these problems and must develop some experience in thinking about what is needed in order to overcome these limitations. To have this knowledge is an absolute prerequisite in becoming active members of a democratic society. Thus, the task of the university is to educate concerned citizens for a democratic, liberal, egalitarian, open civil society.

7) An additional shortcoming of today's universities is their neglect in supporting research on acute social problems, problems that are not appropriately dealt with by existing disciplines. Therefore, universities must encourage, initiate and enable the creation of new disciplines that may prove capable of coping with some of the burning social, economic, and public health issues humanity so far has been unable to address.

8) The problems that researchers, teachers, independent professionals and business people encounter in the real world can never be tackled by the means of any one discipline by itself. While interdisciplinary research and teaching do exist, they are introduced much too late in the educational process, usually at the graduate level in the form of dissertation topics. There are exceptions, and a number of impressive curricular experiments are taking place in the United States and also of late in Europe. Moreover, the idea that for solving problems of an interdisciplinary character it is enough to gather several mono-disciplinary experts, who are sometimes completely ignorant of the work carried out in other disciplines, is unfortunately still prevalent. Genuine interdisciplinary work, however, presupposes a group of scholars who all hold broad interdisciplinary knowledge at least on a level that allows them to collaborate intelligently, if not on par, with experts in other fields. This presupposes an undergraduate education, which trains students in professional depth in one (ideally two) disciplines, but 'marinates' them also in broad interdisciplinary thinking.

9) At the very moment in history when the West is abandoning its strongly Western-centered attitude to the world, the fundamental model of higher education as it was developed in the West is being replicated uncritically in most non-Western countries as a consequence of globalization. Hundreds of new universities are being founded, especially in India and China, without contextually adequate curricula that take into account the all-important differences between "our" and "their" culture, religions and political traditions.

10) While we are not among those who consider the Bologna process to reform European universities a major failure—indeed a great deal that is positive has already been accomplished because of it—the greatest oversight of the Bologna process was the initial presupposition that structures can be tampered with on a major scale without also addressing content and curricula. The question of what is the objective of European universities in the 21st century was only addressed by the unfortunate phrase—systematically misinterpreted—that the desired result of undergraduate education is “employability.” It seems to be some form of sad irony that academics, charged with teaching their students to think critically, failed to apply a non-literal reading to this crucial term. Had they pondered upon the question what employability really means in the 21st century, this would have allowed for a much more multifaceted, intellectual interpretation of the Bologna declaration.

11) The democratic, egalitarian ideal, mostly in Europe, but also in India and China, has resulted in a “one type fits all” or “best” curriculum for each discipline taught in the so-called mass universities (or in Clark Kerr’s term, the “multiversities”). This one “best” curriculum is usually conceived on the basis of the traditional, Enlightenment values discussed earlier. It ignores the fact that different career-paths need somewhat different curricular preparation and thus is inadequate to most students. In other words: it is essentially the opposite of student-centric learning, as such very ineffective and thus ultimately also inefficient.

12) Based on the same egalitarian, democratic principles, some countries provide almost general open access to higher education. Socially and morally we fully endorse this policy, provided an institutional solution is found to make it work. So far the American community colleges with their flexible enrolment models, while not ideal, offer the best solution for providing comprehensive access to higher education. This model could be adapted (not simply adopted) in Europe and elsewhere. Better still would be large-scale experiments with blended learning models.

13) Selective admission policies typically rely on measurable, numerical data of achievements of incoming students.¹ This in itself is a serious problem,

¹ It is never superfluous to emphasize to what extent current standardized tests fail to be useful as selection criteria; not only because the experts on tests are doing a poor job, but also because what these tests measure is largely irrelevant for predicting success in life after the period of conventional studies. In general, what we learn is that for

because the measurable indicators tell us little to nothing about a student's scholarly temper, degree of curiosity or intellectual taste and thus inform us, at best, on maybe half of what we need to know about candidates for admission. Increasing global competition in the wake of digitalization will force a process of institutional differentiation among universities. They will have to become better at identifying students who match their specific educational model and are likely to succeed. The selection criteria, however, should be based on information that is as relevant and comprehensive as possible and should also include career and life goals. Simply relying on student scores in standardized tests is insufficient.²

14) Institutions of higher education are just beginning to embrace the information revolution brought on by digital technology. They are far from exploiting the opportunities afforded by the digital age; in fact a great deal of what is happening today under the name of e-learning reminds us of the early television programs that were essentially radio with pictures. Educators have hardly begun to conceive of how digital technology may transform teaching.

15) There have been many experiments performed with curricula on a narrow institutional or disciplinary basis. They often fail due to the expense and effort involved. It is usually forgotten that

- a) bad money drives out good money, or well-intentioned but ill-conceived interdisciplinary curriculum can corrupt future attempts at introducing well-conceived experiments;
- b) for any reform—experimental as it may be—one needs a critical mass of faculty willing to participate in the experiment;
- c) in complex systems all parts are interrelated and are thus interdependent and mutually reinforcing. This is the case for every network or system, but even more so for systems of higher education as compared to other social systems.

conventional high schools and conventional universities, test results predict that good students will be good students. This insight is of very limited value.

² While early data-driven solutions to this problem may still be too mechanistic, we do see promise in an approach that combines an openness to talent, such as the one outlined by Michael Crow (2015) in his book describing the transformation of Arizona State University. See also Parry (2012).

Rethinking the Enlightenment

Our thinking about higher education is rooted in a critical analysis of the Enlightenment (Elkana 2000). In the last few hundred years our enormous success in the natural sciences, technology, and medicine has taught us not to think dialectically; modern science and technology are anti-dialectical. Yet, if we are to cope with the world we live in, we have to relearn our lost ability to think dialectically. This is a major epistemological task, a task that requires us to rethink the tradition of the Enlightenment. A necessary disclaimer at the very beginning of this argument is as follows: when we criticize Enlightenment values, we are not referring to the great thinkers of the Enlightenment, who were all well-versed in dialectical thinking and were neither dogmatic nor simple-minded. We are referring to the way the Enlightenment has been received and internalized in all sectors of society, including politics, and above all in the entire educational system.

The realm of politics offers us a particularly striking example. The discourse of political regimes has become globalized: formally understood, the same ideologies and structures reign everywhere. Although the actual outcomes are entirely different, most political systems reference democratic ideals in terms inherited and modified from common Enlightenment sources.

In the realm of *Wissenschaft*, or academia, dogmatic insistence on rationalism, objectivity, methodological individualism, the belief in value-free, non-political social science and in the advantages of universal theories (with the accompanying rejection of context-dependent partial theories) have turned the belief in the ‘scientific method’ itself into another form of fundamentalism. Something the late Ernest Gellner (1992) called, rather approvingly, “Enlightenment Fundamentalism.”

What then is “Enlightenment Fundamentalism”? It is the dogmatic, quasi-religious belief that the principles that resulted in unprecedented achievements in understanding, explaining, predicting and utilizing the world for our purposes, must be continuously and universally obeyed. It is the belief that the cluster of values—which consensually is at the basis of our science, technology, medicine, social science, and even some of the humanities—is an absolute prerequisite for our continued success; it is the belief that this cluster of values is valid irrespective of time and place or, in other words context-independent; that, if only we stick to those values, the world is manageable to our benefit. In short: it is the belief that if we do what

we have been doing so far (or think that we have been doing), and only do it better, everything will turn out to our satisfaction.

The cluster of values that continues to be placed on a pedestal consists of the following: universalism, rationalism, objectivity, value-free knowledge, context-independence, the existence of non-political knowledge, an abhorrence of contradictions, anti-dialectical thinking in all domains of thought, absolutism, linear thinking, completeness, the quest for certainty and the belief in its achievability, seeing the world in terms of dichotomies, the idea that only epistemic thinking is relevant for knowledge and an avoidance of *metis* reasoning.³

The list could be extended, or be formulated in a different way altogether. What is important here is the fact that in spite of the enormous success story of the Enlightenment in creating new knowledge in the last few hundred years, it is becoming increasingly clear that this cluster of values is insufficient when it comes to coping with our complex and messy world. It is time for a New Enlightenment, guided by a new cluster of values.

What May Be Done to Address the Problems

Whatever is being proposed, it should be kept in mind that, at least for countries with social welfare systems, as well as for China or India, no government with an aging population and mounting pension and health care liabilities will be able to maintain and adequately fund the kind of higher education systems we know today. In other words, it will not be enough to repeat the mantra-like call on governments to provide additional resources. Higher education will need to become more effective so as to become more efficient and thus less expensive. While we agree that additional money spent on higher education, by and large, is money well spent, we think that universities will have to fundamentally rethink their educational practices in light of the possibilities afforded to us by information technology. Universities need to embrace and foster the new culture of learning we see emerging, which can help them provide a more student-centric education to more

³ *Metis* is the “cunning reason” of the Greeks, not Hegel’s “cunning of reason”; it means that the correct answer to a question—the “correct” truth, so to speak—depends on the context, like in law, and many social sciences. It was the opposite of epistemic reason, and thus Plato’s *bête noir*.

students at lower costs. The private sector and open educational resources will play an important role in providing new high quality academic offerings at low costs. Innovation done right will have to expand access without compromising quality. As it has done in so many other sectors of society, technology may help us do more, with less.

Principles for a new undergraduate curriculum must be developed, which would apply to all curricula before these are contextualized, reflecting the professional, disciplinary and socio-political, economic and environmental context in which they will be introduced.

On many levels the Humboldtian ideals and guidelines, and their roots in Kant's *Streit der Fakultäten* (1779), have to be rethought. One of the important things to remember is that those ideals and principles were meant for a very small number of students, in rich and elite research institutions with a very low faculty/student ratio. Also we should not lose sight of the fact that both Kant and Humboldt were primarily concerned with freeing the university from political control and arbitrary state intervention. For them "Bildung" in the broadest sense was indeed a necessary prerequisite for advanced research; for them "Einsamkeit und Freiheit" (solitude and freedom—a fundamental concept for both Humboldt and Schleiermacher) did indeed represent a desirable mode of life of the mind; for them every researcher also had to be a teacher and their students were conceived of as fellow researchers.

The one-type-fits-all or "best" curricula taught at our "multiversities" with student bodies numbering in the tens of thousands would have been a nightmare for Humboldt and Kant. Having been original, flexible and far-sighted, the thinkers of the time would have developed different ideals and guidelines corresponding with this kind of environment.⁴

Clever policies need to be developed as a means of forcing society to re-evaluate the value of the teaching profession and to combat the common prejudice that research somehow is a nobler or socially more respectable task for academics than teaching, or what in the American context is referred to as "service." The assumption that researchers by definition are more talented individuals than those who pursue alternative career paths must be challenged.

⁴ A historical caveat: when talking of the work and impact of Wilhelm von Humboldt one should always keep in mind some other all-important figures without whom there would have been no "Humboldtian revolution of Higher Education": Freiherr von Stein, Friedrich Schleiermacher and Alexander von Humboldt among others.

Here a major difference between the United States and the rest of the world must be kept in mind: a great many of university teachers in the United States are not involved in research. Unfortunately, they are usually underpaid, and socially discriminated against by “the system” as well as by those professors who do research. If an attempt were to be made to introduce teaching faculty on a large scale in Europe, or in America for that matter, they cannot be allowed to become second-class citizens of academe. To bring about such change will not require a “cultural revolution” or any sort of major “re-education” public relations campaign, but rather will depend upon some unequivocal, well-chosen incentives and important symbolic gestures. For example, teaching staff should enjoy all the privileges and perks of the research faculty which today include the following: job security, equal salary, sabbaticals, access to relevant literature, travel allowances, etc. These advantages alone would not be sufficient to place them on equal footing with their research-minded colleagues, but it would certainly be a necessary condition for purposeful reform. Governments should use this type of reform first and foremost as an instrument to bring down class sizes and lower the faculty/student ratios to an acceptable level, instead of abusing this move to impose another round of cost-cutting on higher education.

Today it has become easy to acquire information. The idea of the university as a place where students, treated like empty vessels, are simply filled with information is obsolete. The new purpose of the universities, and specifically of teachers, is more the task of instructing students on how to gather information, to organize it, criticize it, and turn it into knowledge. This must occur in small groups of students and instructors and through the interaction with fellow students. Instead of giant lecture halls we need smaller spaces. Even the physical appearance of the university therefore will drastically change. We must return from a factory hall model to the workshop. By eliminating the large introductory courses, many hours spent preparing lectures could be used to work directly with students and addressing their questions.

Teaching faculty should teach on average 15 to 18 hours a week in direct contact with students. We shall discuss later why and how we think this could be made possible; let us mention here that the aim should be in transforming the teaching model from mass processing to small group instruction with the creation of mentoring relationships. Based on the many important insights generated by the NCAT’s (National Center for Academic

Transformation) Course Redesign Project and William Bowen's Ithaka project (www.ithaka.org), we suggest that the traditional lecture format, with its primary purpose of transmitting information, should largely be replaced by adaptive online resources, peer-to-peer teaching, problem-oriented interdisciplinary discussion in small groups, undergraduate research projects under faculty guidance, even with "heretical" ideas such as peer-grading.

Teaching faculty should be encouraged to keep up with the research in their field and in related fields and to continuously re-examine the foundations of their discipline, but should not be required to push the frontiers of their discipline through primary research. In light of the catastrophic conditions for student advising, many professors today hardly have the time for research to the extent that they either publish nothing or nothing worthwhile. It is important that teaching professors should not be forced into a publishing groove, but they should be committed to clear teaching goals and both qualitative and quantitative evaluations. They should also face review to determine their professional competency in, among others, staying abreast of current research.

It is important to point out here that a significant percentage of published papers are of mediocre quality (we would venture to guess that on average, in all disciplines, this may amount to up to 85% of published papers). Even more importantly, the system has created a most severe straightjacket in making the very livelihood and future promotion of most faculty members dependent almost exclusively on publications. It is a first sign of hope that a certain tendency to re-evaluate the importance of teaching can be observed in tenure granting procedures. Yet, there are hardly any faculty posts at reputable institutions for those who are enthusiastic about teaching, deeply knowledgeable in their discipline, have relevant practical experience, but care little about doing cutting-edge research. This will need to change.

An all-important goal in the pursuit of introducing change in higher education is the creation of an intellectual community and with it an intellectual climate. Many university professors—from among the few who think about matters of curriculum and substance—claim that the climate in universities is anti-intellectual, market-oriented, amounting in other words to a rejection of the values of a life of the "mind." Once we have addressed the concerns and problems spelled out above, we can confront the all-important issue of the "intellectual climate" of the universities. What this means is that members of the community will take an active interest in all

kinds of new ideas, from all the various fields found in a university setting. This is what qualifies as intellectual open-mindedness.

Such a healthy intellectual climate is by definition elitist as well as egalitarian. It is elitist in that it discriminates according to performance and intellectual achievement; it is egalitarian in that these alone are the only criteria for access and admittance. In fact this internal tension between an incurably elitist and a genuinely politically and socially egalitarian approach is fruitful and animates many of the proposals in our book. To encourage every single person to pursue higher and greater achievements, irrespective of his or her age, status, profession or lifestyle, is an elitist proposition; but then again, making this a universal principle is egalitarian. This point is important for us here because much of what we say will seem at times elitist, while in other respects, conventionally egalitarian. This distinction will become spurious in the context of the arguments presented in this book.

The University in the Age of Globalization

“Globalization” has become a buzzword. When discussing it, the spectrum of views moves between seeing an aspect of contemporary globalization in every aspect of life and the view that there is nothing new or remarkable about globalization today, as it was present in some shape and form throughout history. In a way, both claims are true and we need some conceptual fine-structuring in order to make our point.

International trade has indeed helped to spread inventions, new ideas and knowledge in general since ancient times. In terms of scope and depth, however, what we witness today is unprecedented, and it is universal. In a very real sense the world has in fact become one: besides technology, there are many cultural and political ideas as well as social institutions that have become globalized. This is notably true for the university.

In what has been written on the subject, globalization has been characterized above all in terms of economic matters and new communication technologies. It soon became evident, though, that many other aspects, such as political ideologies, have also become globalized. Democracy has become more widespread in the last decades than ever before. As mentioned above, it is not any particular political regime itself, but the language, the political discourse, revolving around the ideas of individual rights and freedoms, that

have become globalized. For the average person, politicians today all sound very much alike, irrespective of whether they are representing genuine democracies, military dictatorships, communist one-party systems or fanatic theocracies. They evoke similar slogans and profess to adhere to very similar ideals.

On the other hand, the fears of a world becoming an undifferentiated mono-cultural flatland, using a universal, but mediocre English as a means of communication, have proven to be unfounded. On the contrary, anything not falling under the aegis of economic interests or part of the universal IT system, is being emphasized and cultivated locally now more than ever, be it in the form of local culture, religion, language, traditions, etc.

As indicated above, the university curiously belongs to the first category: in the last hundred years the Western model of higher education has been emulated across the globe. By now, the fact that the core ideas that define universities were developed in the West has lost much of its meaning and political overtone, and what remains is their striking similarity. The interesting question of what is it exactly that is being replicated when universities borrow from an existing model normally goes unanswered. The universities in developing and emergent countries today are either genuine copies or, even worse, local structures that have simply copied the curricula of Western universities. The latter is a particularly curious state of affairs, as the institution then functions as some kind of intellectual Trojan horse spreading culturally inadequate knowledge.

There is strong empirical evidence for this uniformity of curricula on an international scale. The Stanford sociologist John W. Meyer and his “school” have discussed and documented this worldwide similarity in great detail. They explain it as anti-functionalist and see the reason for the emergence of the status quo in a general cultural climate, which, in their opinion, has led to a universal appreciation of Western-style curricula: “it is often quite difficult, in examining university catalogues, to find much curricular material that directly indicates just what country, place and period the catalogue is covering (...) Another indicator of universalism appears in the detailed contents of courses that initially appear to be immediately and obviously role-related” (Frank and Gabler 2006).

This criticism that most of the research on curricula is either about a single discipline, or a single country or even a university, matches our experience. Very rarely does one find comparative research on the content and curricular

of higher education. While we agree with the diagnosis, we disagree with the analysis of the causes for this phenomenon. It is not conscious reflection upon what curricula should be that led to the dominance of the Western model, but, indeed, a lack thereof.⁵

One of the core objectives of a new approach to curricula would be to create a general awareness of the acuteness of the world's problems and the urgency of taking action. While noble motives are typically evoked in the context of ceremonial speeches, the university's various stakeholders generally do not commit themselves to clear aims for their institution. "Global Challenges" and the role of the university in finding intellectual or conceptual solutions for these challenges on a theoretical, and to a certain extent on a practical, level is not usually formulated as a task for the 21st-century university. Specific research institutes dedicated to solving well-formulated problems exist, but these usually are couched in terms of existing disciplines and belabor the well-known (albeit genuine) needs for support in manpower, financing and equipment. Yet, the most urgent global challenges remain: hunger, poverty, climate change, economic inequality, energy sources, the spreading of infectious diseases and armed conflict. We need to develop a new way of thinking.

What unites East and West, North and South—that is, world consciousness—is the growing crisis of the physical wellbeing of our planet. The environmental, economic and public health crises are the unintended consequences of the very success of the scientific-technological-economic pursuits of humanity in modern times. Our success does not only place a great burden on the environment. The benefits we have accrued are also very unevenly distributed. As Paul Collier (2007, 2010) has pointed out, poverty in some parts of the world occurs simultaneously with the unprecedented accumulation of wealth in other parts of the world. In the last thirty to forty years, however, the gap between rich and poor has increased even in the richest countries.

The political theories inherited from the 19th century did not prepare us for such phenomena as the spread of religions throughout almost the entire

⁵ Lest we be misunderstood, we wish to emphasize that what we want to change is not the teaching of disciplines: we need them as a rigorous, methodologically rich foundation for all knowledge. We are suggesting that disciplines should be accompanied by interdisciplinary seminars discussing real-life situations, which demonstrate that life is complex, messy and unpredictable.

world. The Enlightenment assumed “just be rational enough—religion will disappear.” This turned out to be an illusion. Similarly, classical political theory—born in the Enlightenment—has proven incapable of coping with the emergence of new forms of regimes, which are neither totalitarian, nor essentially democratic.

On yet another level, new problems have emerged, such as global warming and the scarcity of water and energy resources, problems that could arguably be called “objective,” be they natural or manmade. They are distinguished by the fact that no one discipline can cope with them. We need new, integrative disciplines, as, for example, a New Economics should integrate classical, mathematical, model-based mainstream economics with concepts stemming from anthropology, sociology and history, such as institutions, norms, and values and aspirations. There has been some very fundamental work done on poverty, but it is not the same as creating an entirely new discipline (Banerjee and Duffie 2011). Similarly for understanding and coping with the spread of infectious diseases like HIV/AIDS and ebola, multi-drug-resistant tuberculosis, or malaria, a new discipline is needed that would integrate molecular biology and some of the relevant social sciences.

We argue that, to a large extent, universities are themselves to blame for their failure in responding adequately to the external pressures of the day. Barring the work of a few exceptional departments and individuals here and there, universities have so far proved incapable of addressing precisely those problems that are most pressing to contemporary societies. Paradoxically, by stretching the university’s functions and capacities to the breaking point and blurring its identity, globalization created the exact opposite of what we should expect of places of learning and scholarship today.

A century ago no one would have predicted that the university would be responsible for founding new disciplines to respond to societal problems and needs. Yet, ultimately the university is the only social institution having the intellectual scope, depth and breadth to be called upon to “invent” the new disciplines required.

Rethinking the Enlightenment and Global Contextualism

Western capitalistic society gained its material wealth due to the set of Enlightenment values outlined above. These values became centrally important

in the 19th century, which drew on practical lessons from what it understood to be the message of the Enlightenment. For almost two centuries research, teaching, business practices, economic policy and politics in general were guided by universalism, absolutism, positivism, faith in science and a dedication to relentless technological progress.

We should get used to the fact that all knowledge must be seen from within a certain context: not only when looking at its origin, but also when trying to establish its validity and even when looking for its possible application in solving pressing problems. A short description and metaphorical formulation for this much-needed epistemological rethinking could be the following: “from local universalism to Global Contextualism.” Add to this the famous warning by Isaiah Berlin that there is no—nor can there ever be—a consistent set of values. Even on the level of values the world is complex and messy.

One special aspect of Global Contextualism, to be discussed below, is the integration of parts of local knowledge into what is considered universal general knowledge. In some areas local knowledge turns out to be extremely efficient, in fact decisive for success or failure. It took international organizations such as the IMF and the World Bank several decades to realize what loss their efforts suffered from neglecting local bodies of knowledge. This is especially true for the local wisdom that is so crucial in matters of public health, water distribution and preservation and agriculture.

Global Contextualism is the idea that, whatever the academic discipline, every single universal or seemingly context-independent theory or idea (typically rooted in the tradition of the Enlightenment) should be rethought and reconsidered in every political or geographical context. Global Contextualism is one of the most important developments in the history of ideas since the Enlightenment, and universities are uniquely placed to help us understand it and to promote its growth. Therefore, it is all the more regrettable that few universities raise questions concerning the adequacy of the standard academic disciplines in addressing the real world we live in.

What we must keep in mind is that discussing questions of context is first and foremost to raise questions about meaning. But it is precisely meaning—with all its flexibility, plasticity, ambiguities, and contradictions—that is much too often neglected by universities for both systemic and intellectual reasons. These reasons can be partially subsumed under what we think is a misinterpretation of academic freedom, as it is understood today.

Academic Freedom

Academic freedom usually applies to tenured professors. It is severely limited for students, graduate students, and scholars in the early stages of their career until, with tenure, they gain the freedom to conduct independent research, investigating essentially whatever they want. More significantly, tenured faculty consider it their right, as an inherent characteristic of academic freedom, to teach whatever they want. This usually results in professors teaching courses covering their own research topics, or courses that for whatever reason please them, often with little relevance to an integrated curriculum necessary for the proper education of students. The result of this is that young people are thrown into a groove that they can never, if they want to, pursue an academic career of their own at some point.

Funding & “Publish or Perish”

The antiquated curricula have a counterpart in the design of grant-giving policies for funding academic research. Foundations today often attune themselves to the research agenda and institutional organization of universities. This is an unholy alliance that severely limits the academic freedom of the research community. In many countries, leading research foundations talk about embracing interdisciplinarity as an important priority. At the same time, they encounter enormous difficulties in evaluating truly interdisciplinary research. These are, we are fully aware, controversial claims. But what we are proposing here are fundamental mutations in the institutional framework of academic research that need to be urgently addressed.

Discussions on curricula and institutional design often tend to concentrate exclusively on elite universities—that is, the great research universities of the United States and the handful of leading universities in Europe. However, this focus on a few outstanding institutions can easily mislead those thinking about the future of academic research and higher education. Under the pressure of the role model provided by the elite institutions, it is research that is perceived as the one and only task of the academy that ultimately matters. Teaching is usually mentioned in lip-service sermons, while promotion committees at most universities rarely consider the achievements of the dedicated and successful teacher; and when they do it is never on par.

The rationale for all teachers to be researchers was born in the very different context of the small, elite, German Humboldtian Research University, which then spread to the United States in the 1870s. Yet, the research-imperative unfortunately has spread even to the mass universities, in fact even to teaching colleges that suddenly aspire to become mini-research universities, because of the prestige and preferential funding that goes with research. As a consequence, every faculty member has to be a researcher and, what is worse, author of an unending avalanche of publications.

As a result there is the enormous and still growing pressure to produce publications. This, by now, has become a *sine qua non* of academic success, indeed even of mere survival in academe: the professor is appointed *de jure* for teaching, but *de facto* gets his/her salary for producing publications. This is perhaps the most important limitation on genuine academic freedom, a constraint that is all the more regrettable in light of the inferior quality of much of the published output. This stands in stark contrast to the huge burden the imperative to publish places on the shoulders of scholars and professors.

For a small group of outstanding researchers and their doctoral students, the ideal of the inseparability of *Forschung und Lehre* (research and teaching) is indeed still valid. For these researchers, who are primarily mentoring a few doctoral students, the quality of their teaching is not defined by their ability to make the material accessible, or other characteristics that typically make for a good teacher. But this is the exception and not the rule.

We should therefore investigate whether these two activities could be otherwise organized. The basic idea would be to offer junior academics three different tracks: 1) faculty who do research and who work with the 5% of students moving into advanced scholarship and research; 2) faculty who will combine teaching and research; and 3) faculty who will teach and do only the kind of research necessary for good teaching, i.e., remaining up to date on the state of current research, but not doing independent research projects with publication in mind. It is for those in the second and third category that we should consider doing away with the unbearable burden of having to publish. In short, our proposal is to separate the demand for doing research even for teaching purposes from the demand to publish.

Principles for a New Undergraduate Curriculum

In order to cope with the problems outlined above, we must concentrate on developing new types of undergraduate curricula (the plural is not accidental) that respond to the intellectual and social needs of the 21st century. The objective of these curricula should be educating what we call “concerned citizens.”

Our proposal rests on the following three pillars:

- 1) from the first year on, seminars should be taught dealing with real-life situations parallel to rigorous introductory courses in specific disciplines;
- 2) from the onset students should be “marinated” in genuine interdisciplinarity, so as to give them a broad intellectual horizon;
- 3) right from the start elements of non-linear thinking should be introduced to students at the very beginning of their studies to adequately address the cognitive dimension of concerned citizenship.

One cannot emphasize enough that we do not support doing away with rigorous instruction in clearly defined academic disciplines; this would be intellectually irresponsible. There have been many experiments in the past two hundred years to replace disciplines by purely problem-oriented teaching. These experiments generally failed. However, it is time that we act on the insight that a young person, after completing three or four years of university studies, will typically face problems “out there” that are ill-defined and interdisciplinary in nature. This is irrespective of whether he or she goes on to do research, works for a business or a non-governmental organization (NGO), goes into politics, into teaching or chooses one of the professions. If we stop confusing the treatment of one symptom with the solution of the entire problem, then it becomes clear: problems beyond multiple-choice questions cannot be solved by one discipline alone.

In order to prepare students for the interdisciplinary thinking required of them, rigorous and stimulating training is necessary from the outset of undergraduate study. It is for this reason that we propose to teach both basic introductory, disciplinary undergraduate courses alongside seminars that deal with real-life situations and mix students from all sorts of different disciplinary backgrounds. These seminars will expose students to conceptual inconsistencies, to phenomena or situations where the basic theory of a specific

discipline does not work and even to the basic incoherence or incompleteness of certain fundamental theories.

Our century-old resistance to such authority-challenging ideas is due to widely held misconceptions concerning the needs of children and young people in general. Particularly popular and of detrimental influence has been the idea that what an aspiring and gifted young person needs is intellectual certainty, in other words, certainty about the correctness and reliability of his or her sources of knowledge. However, what a young person really needs is emotional certainty (including a basic sense of physical and economic security), not intellectual certainty!

This basic misunderstanding is responsible for the ambition of those engaged in education (in our specific case the authors of university curricula) not to expose young people to contradictory or conflicting ideas. Educating human beings in such a way as to separate academic knowledge from the reality of life is an absurdity. Highlighting and even embracing contradictions is the right, and possibly, the only way to cope with the complexity and messiness of the world and therefore should, in our view, be a key element of undergraduate education.

The term “concerned citizen,” as we shall analyze below, carries moral implications. At this point, however, we are not so much concerned with its ethical dimension—important and indispensable as it is—but rather with the underlying cognitive and intellectual content of this term. Risking again redundancy, we restate the following: we have to educate concerned citizens, that is, to educate young people—all of them—in a way that allows them to gain an understanding of the main problems of the world, or better said, the kind of problems one encounters on the first pages of any quality newspaper.

The concept of a “concerned citizen” is of course a normative concept. Educating concerned citizens means, at one level, to raise the awareness of young, clear-thinking individuals to the most significant challenges facing human beings and in so doing to awaken the desire in them to contribute in some way to finding solutions to these challenges. These are the problems we find spelled out on the front pages of the daily newspaper. The concept of the “concerned citizen” has, however, another component: a moral and social side dimension.

The moral and social dimension is very often invoked, as for example in a report of the American Association of Colleges and Universities (2007),

in which the concept is formulated as “Personal and Social Responsibility.” This involves civic values and engagement, knowledge of the major social problems that plague the world and the fundamentals for social and political activism. At the same time the report is too easy on the universities, maintaining that the university is not supposed to deal directly with political issues in order to avoid becoming too politicized. At this point we would like to interject the following question: How far can the world community go in maintaining disinterested neutrality in the face of threats to our basic livelihood?

Beyond these questions we are more concerned with directing our attention to the significant cognitive and intellectual dimension behind the idea of a “concerned citizen.” Importantly, what is neglected is that the moral motivation to act exposes an epistemological gap in existing disciplines that prevents us from dealing with many of the above-mentioned problems. The substance of a Bachelor’s degree program does not prepare students to deal with the larger issues facing humanity and to work toward finding solutions for them. They are not made aware of the complexity and multifacetedness of the real-world problems. This last point is of the utmost importance, because the limits of scholarship when it comes to dealing with complex problems are usually kept outside the limelight of undergraduate education. Hence, there is a tendency to ascribe the lack of preoccupation with these issues exclusively to immorality, corruption, political interference and other such factors. In the long term, this fatalistic attitude poses a threat to democracy.

Curriculum Research and the Future of Higher Education

The notion of curriculum research is almost entirely unknown in continental Europe and most of the rest of the world. It is typically confused with didactics. The United States, Great Britain, the Scandinavian countries and the Netherlands are among the very few countries where serious attention is paid to curriculum research.

Curriculum research involves the epistemologically oriented study of the foundations of areas, disciplines, or clusters of disciplines and the utilization of the results and findings of high-level research in teaching and the design of research programs. Without a serious commitment to curriculum

research—a complex undertaking involving the concentrated effort of several research teams over many years—no university reform can be successful.

The short-term prospects for such an intellectual enterprise are not very good. In the wake of the financial crisis, the “gatekeepers” are becoming ever stronger and more resistant to the idea of change. Therefore most universities, conservative by nature, are unlikely to become partners for curriculum research and curriculum reform efforts. Universities especially in Germany are interested in everything, except themselves. No sub-discipline is too minor for their purposes. But try to find a department chair interested in normative questions concerning what university instruction is supposed to achieve, and your search will be in vain.

On the other hand, one encounters in more and more universities and research groups brilliant young scholars who are socially aware, dissatisfied with the pace of change in their institutions, and ready to invest time and energy in bringing about the desired changes. Financial support has to come from outside: from independent foundations, strategic alliances with stakeholders in the private sector, intergovernmental research organizations and others. At a later stage, the novel curricula will have to be tested at avant-garde universities.

As with the precept that it takes only a few committed individuals to change the world, the creation of a new curriculum has to be spearheaded by a critical mass of academics. They will not only have to develop good ideas but also be prepared to teach that which will become part of a new curriculum. They will have to abandon their present “luxury” of teaching whatever strikes their fancy. If they are ordered to innovate from top-down, many professors will consider this an infringement of their academic freedom. Therefore the changes to curriculum must move from the bottom up. This is not to say that the university leadership has no role to play: the commitment to reform must come at all levels of the university administration, from President, Rector/Provost, to the deans to heads of departments. Forging such alliances for change, we believe, is a formidable, but worthwhile challenge, offering the best possibility for effecting change and for re-imagining university teaching.

Implementing our substantive recommendations will have a very real impact on the practice of teaching. In view of newly targeted aims and the transformative potential of information technologies, universities will need to engage in a fundamentally new assessment of what “university instruction”

really means in the 21st century. Serious questions about what can be digitalized for effective learning, for example, will have to be posed and answered. Recognizing that everyone has access to bewildering amounts of information means that teachers in the traditional sense of that word are no longer necessary for learning. As Carol Twigg (2003), an important pioneer in exploring the use of information technologies in improving teaching at large universities, put it: teaching is no longer necessary for learning to occur.

It is valid enough to develop new teaching structures that above all promote the free flow of information and knowledge between all members of the university community and that put students in the position to learn with and from each other. Especially teaching formats, which aim at transmitting information from instructors to students, will become, with rare exceptions, obsolete.

This does not mean that we no longer need teachers. On the contrary, personal interaction, coaching and mentoring will gain in importance. They will perform a key role in inculcating the ideas behind the New Enlightenment. Unless we change the roles of professors and students, many of the goals spelled out below will not be achieved. The motivation behind implementing information technology will be to really focus on students' needs and to guarantee intensive personal support and individualized instruction. More technology can offer more, not less, personal contact between students and teachers. In view of everything we know today about what is theoretically possible, we have to be more ambitious. We have to rise above ignorance, inertia, legal restraints and self-interest.

Some Speculative and Optimistic Thoughts

Let us end on an optimistic but, as we hope, not irrationally optimistic note. Many of the problems outlined above have been aggravated by the fact that in recent years talented young people, especially in the United States, seem to have preferred the fast cash paid in the private sector to careers in politics, public service or academe. Although the increasing debt of graduates from the United States and Great Britain has only exasperated the problem, there is still the real hope for a new orientation.

It appears that a new consensus is emerging among the new generation educated in a globalized world that shows more concern for the social

impact of major social institutions (Porter and Kramer 2011). The generation that has grown up with repeated scandals, financial crises, September 11, continual states of war, global terrorism, global warming and environmental catastrophes, immoral gaps between the very rich and very poor—the list could go on—is becoming keenly aware of the fact that “more of the same” will not be enough and that new approaches to global governance are needed.

Even when there are no simple solutions to our global problems, it is promising that young people, through political protest—from globalization critiques to the Occupy Wall Street movement—have attempted to play a part in global political issues. This development includes the new respect emerging among the young for entering into politics, as well as for working for an NGO, a social entrepreneurship project or a think-tank, which is in fact considered outright “cool.” In fact, we have high hopes that “Generation Y” may in fact turn out to be “Generation Why?” or the “Millennial Generation,” a generation committed to asking the pertinent questions rather than assuming, under the banner of standard thinking, to know all the answers. The connective power of new media may help to create a new sense of global consciousness leading this generation to challenge the status quo in ways not seen since 1968. Nathaniel Whitener (2010) put it bluntly and concisely with the following: “Historically, cool has been fundamentally about not caring about things. (...) But there is a change afoot. All of a sudden, giving a shit is cool. Being passionate is cool. Getting involved is cool. Being creative is cool. Building real things is cool.”

And another optimistic thought, impressionistic as it may be, is that for the last few decades, many feared that globalization would have an intensely homogenizing effect, producing a global cultural flatland. Clearly, this is not the case. As diversity increasingly is being seen as an asset, local cultures, religions and languages, by and large, are flourishing.

In contemporary democratic societies the question of justice is inextricably tied up with issues of education. In the 21st century, one of the greatest aims of a just society is to create the preconditions in which unequal outcomes are legitimized through the highest degree of equality in opportunity (or capability, according to Sen 1982) at the outset. This, rather than maintaining international competitiveness, is the most crucial rationale for maintaining the system of public (higher) education.

As a tribute to Tony Judt (2010), a much-admired friend, scholar and intellectual, whose death was mourned by many, we would like to quote the end of his last publication entitled *Meritocrats*:

In my generation we thought of ourselves as both radical and members of an elite. If this sounds incoherent, it is the incoherence of a certain liberal descent that we intuitively imbibed over the course of our college years. It is the incoherence of the patrician Keynes establishing the Royal Ballet and the Arts Council for the greater good of everyone, but ensuring that they were run by the cognoscenti. It is the incoherence of meritocracy: giving everyone a chance and then privileging the talented.

CHAPTER 2

THE IDEA OF THE UNIVERSITY

The following two chapters will deal with the idea of the university and the aims or purposes of the university. The two are closely connected, yet we decided that it is worth treating them as separate chapters. The perennial discussion of the aims of the university has continued for many hundreds of years. For our purposes, however, it seems useful to begin with two significant events in the 19th century: a memorandum written by Wilhelm von Humboldt in 1810 that served as a basis for the establishment of the University of Berlin in the same year and the publication of Cardinal John Henry Newman's *The Idea of the University* in 1852.

Humboldt ideas soon came to dominant European ideas about the ideal of the university and influenced the development of research universities in the United States. What came to be called the Humboldtian model of a university was based on several principles, among them and most importantly: 1) unity of research and teaching; 2) freedom of teaching; and 3) academic self-governance (Humboldt 2002 ed.). Cardinal Newman's idea of a university articulated many of the same themes, particularly that universities should be places of teaching and learning not dominated by religious authorities and that all branches of knowledge should be available, including controversial topics.⁶

These views, often subordinated in the intense focus on economic outcomes and organizational structures, have nonetheless continued to resonate in the life of universities. Their meaning was concisely and brilliantly formulated by Geoffrey Boulton and Colin Lucas (2008) in their paper "What

⁶ Newman's title has subsequently been used repeatedly, often to disagree with his ideas. See, e.g., Jaspers (1959) and Habermas (1987).

are Universities for?”: “A University is a place ... whither students come from every quarter for every kind of knowledge; ... a place for the communication and the circulation of thought, by means of personal intercourse ... in which the intellect may safely range and speculate. It is a place where inquiry is pushed forward ... discoveries verified, and perfected, and ... error exposed, by the collision of mind with mind and knowledge with knowledge ... One generation forms another. This is indeed still the universal idea of a research university.”

The Ideal of the Research University

The “Western” university, based on the ideas of Humboldt and Newman, turned out to be an unprecedented success. It was flexible and adaptable, could integrate many new developments and withstand the enormous expansion in fields of study and student numbers. This ability to incorporate innovations is rooted, before Humboldt, in Immanuel Kant’s “The Conflict of the Faculties,” written in 1789. In his opening paragraph, albeit in different terms, Kant lays down the principles of today’s “multiversity”:

Whoever it was that first hit on the notion of a university and proposed that a public institution of this kind be established, it was not a bad idea to handle the entire content of learning (really the thinkers devoted to it) by mass production, so to speak—by a division of labor, so that for every branch of science there would be a public teacher or professor appointed as its trustee, and all of these together would form a kind of learned community called a university (or higher school) ... the university would have a certain autonomy (since only scholars can pass judgment on scholars as such) and accordingly it would be authorized to perform certain function through its faculties. (Kant 1959 ed., 23)

The ideas contained in this passage were used as the principle for establishing rigid disciplinary boundaries. It had such enormous influence that even Humboldt who otherwise had a holistic understanding of *Wissenschaft* could not counter it. As Mark Taylor (2010, 53) emphasizes, “By distinguishing the responsibilities of professional schools from the faculty of arts and sciences, Kant created a source of conflict between faculties that still plagues universities.” That Kant’s intention was quite the opposite does little to help us

here. His aim at making the sharp distinctions was rooted in his realization that theology, law and medicine had to serve the needs of society, which in the understanding of the time was largely synonymous with the state, and the state regulated them. The rest, which we now call the arts and sciences, and which Kant simply called the philosophical faculty, was not of much interest to the state, as it was dedicated to finding Truth as such. Yet, Kant thought that even this faculty had to be protected from intervention and regulation by the state. Research in the philosophical faculty would be guided by pure and universal reason, and its main purpose was the exercise of criticism. It was the philosophical faculty that Humboldt and later Cardinal Newman were referring to in their writings. The pursuit of knowledge was for knowledge’s sake only, and a quest for usefulness was alien to it. There was no talk about the university’s contribution to Prussia’s or Ireland’s international competitiveness.

From “Solitude and Freedom” to the Multiversity

As the Humboldtian idea of the university evolved in the 19th century, particularly in Germany, full professors, who were typically appointed chair of their departments for life, generally dominated the research university. Financially, the university was fully dependent on the state, which, however, interfered very little, if at all, in academic matters. This combination laid the groundwork for Germany’s universities to become the best research centers in the world, in all branches of *Wissenschaft*—influencing particularly the growth of late 19th and early 20th century U.S. universities.⁷

The ideas embodied in the Humboldt and Newman university received further development in the United States, initially in the emergence of newly established research universities, like Johns Hopkins and the University of Chicago, and in the transformation of older universities like Harvard and Columbia. The most prominent articulation of these developments occurred

⁷ Interestingly, this very combination of institutional autonomy and financial dependency also caused the decline of the German University during the Nazi regime. The very fact that under National Socialism professors did not use their independence to criticize the criminal politics of the regime, contributed to the eventual decline in influence of German academia.

in the work of Abraham Flexner, who had studied at Johns Hopkins University and, importantly, at the University of Berlin.

Flexner followed with admiration the “scientification” of higher education. This was his idea of the university. He directly influenced the “scientification” of medical education by writing the highly influential Flexner Report on the study of medicine in 1910, which called for university- and hospital-based medical studies, and by comparing the American, English and German universities in 1930. He approvingly saw the introduction of the Humboldtian guidelines of *Lernfreiheit* (freedom of learning) and *Lehrfreiheit* (freedom of teaching) into American universities, as they brought about an increase in the number of courses and the elective system.⁸ This elitist, research-oriented university was Flexner’s ideal of “The Idea of the Modern University,” a place he described as an “organism, characterized by highness and definiteness of aim, unity of spirit and purpose” (Flexner 1930, 178).

Yet even as Flexner wrote, Americans were already committed to a different kind of university than the traditional Humboldtian, elitist research university. Beginning with the passage of the Morrill Act in 1862, the land grant university with its call for practical education for large numbers of people would compete and in many ways overwhelm the traditional Humboldtian image of the university. This experiment, introduced the democratic and quite literally down-to-earth land grant movement, leading to the birth of the new American university, and laying the foundations of the “multiversity.”

By the time Clark Kerr’s *The Uses of the University* (1963) appeared, he was describing for an American audience, and from the point of view of problems that then preoccupied American society, a phenomenon that would have been inconceivable decades earlier—and in many ways remains hard to understand even today outside the United States. Yet Kerr’s description is highly relevant for the entire globalized world, then and now. Many of the predictions and analyses remain valid today. Those that do not, in our opinion, deserve serious attention as well.

In the original lectures at Harvard that led to his book, Kerr popularized the concept of “multiversity.”⁹ Calling the 1960s multiversity an “imperative”

⁸ Charles William Eliot, president of Harvard University between 1869 and 1909, had actually introduced and championed the elective system as essential so that professors could teach their research specializations and students could learn in depth.

⁹ In 1918 Henry Adams, in “The Education of Henry Adams,” talked about a “multiverse”; so did William James in connection with philosophy, when contrasting pluralism

that had replaced Cardinal Newman's "The Idea of the University" as an academic cloister or ivory tower, the 19th-century research university as exemplified by Johns Hopkins, which brought the German research university model to the United States, as well as Flexner's 1930 "The Idea of the Modern University."

Indeed, a few years later, in 1967, Kerr wrote a preface entitled "Remembering Flexner" for a reprint of Flexner's book, *Universities—American, English, German* (Flexner 1967), in which he argued that Flexner had described with great clarity what seemed to him in 1930 the ideal "idea of the university." But Kerr also argues that Flexner had thought that the golden age of American universities was behind them, while in fact it was ahead of them. The multiversity as it developed after Flexner's time successfully combined research on the highest level and the performance of a far broader mission in society. American universities would subsequently engage in almost all of the things that Flexner opposed, such as service activities, professional education and extension work. And yet the universities flourished. But what the modern research university increasingly neglected was undergraduate education and teaching in general, something which Kerr himself described as one of the university's worst "pathologies." Flexner, Kerr believed, was too enamored of the German University and its American offspring, Johns Hopkins University. He was too insistent on critique and in search of coherence and unity of purpose and believed that quantity is always the enemy of quality. His admiration for the overly powerful autocratic presidents made him underrate the value of faculty democracy. He was blind to the constructive dimension of the populist drive in America to make education accessible to all and he failed to see the potential for relentless technological advance.

By the 1960s the university had already abandoned its elitist character; the teaching of undergraduates was seen as a "duty," rather than a necessary evil, something Flexner called, with horror, a "service station." Flexner, however, had seen already in the 1930s what Kerr would later highlight; namely, that the universities are no longer communities, but "they are merely administrative aggregations, so varied, so manifold, so complex that administration itself is reduced to budgeting, student accounting, advertising, etc. Such

with monism, in his 1909 "A Pluralistic Universe"; Kerr also mentions university presidents who had used the term "multiversity" before him.

aggregations, even though called universities, simply do not possess scientific or educational policy” (Flexner 1930, 179).

The creation of the multiversity brought with it the enormous influence of university administrations, particularly in the United States. In Europe and other Western-oriented parts of the world, universities developed into gigantic public institutions of mass learning, lacking leadership due to the incoherent self-administration. Rising budgets in the natural sciences bolstered their importance, heralding the decline of the humanities and the deterioration of undergraduate teaching. The growing importance of science and technology, and the subsequently increasing importance of research in universities also resulted in extreme disciplinary specialization. While the root cause of these developments, the competitive race in the time of the Cold War, is ebbing, its consequences are still with us even today. If anything the problem has grown worse since the time Kerr was writing in the 1960s, and there is no question that in order to cope with the intellectual and social problems of the 21st century a radical re-orientation will be needed.

The Problem of Commercialization

A more recent development, observed mainly but not exclusively in the United States, which causes some substantial disturbance to the present status quo, has been the commercialization of the university. Several important books have appeared that focus on this issue: Derek Bok’s *Universities in the Marketplace: The Commercialization of Higher Education* (Bok 2003); Daniel S. Greenberg’s *Science for Sale: The Perils, Rewards and Delusions of Campus Capitalism* (Greenberg 2007); David L. Kirp’s *Shakespeare, Einstein, and the Bottom Line: The Marketing of Higher Education* (Kirp 2004); Frank Donoghue’s *The Last Professors: the Corporate University and the Fate of the Humanities* (Donoghue 2008); and Sheila Slaughter and Gary Rhoades’s *Academic Capitalism and the New Economy: Markets, State and Higher Education* (Slaughter and Rhoades 2009).

An especially scathing attack on the phenomenon of commercialization is that of Andrew Hacker and Claudia Dreifus in their book, *Higher Education? How Colleges are Wasting our Money and Failing Our Kids—and What We Can Do About It* (Hacker and Dreifus 2010). Their central argument concerns the problems of “Administrative Overload” and the “abysmal” status of teaching.

With regard to teaching, we shall return to this subject in a later chapter; here, however, it is worth pointing out the immense growth of university administrations: “Between 1976 and 2007, the ratio of college administrators to students basically doubled. In 1976, for every 1000 students, there were 32 adults holding non-faculty positions. By 2007, there were 63 such people for every 1000 students” (Hacker and Dreifus 2010, 30). No less disconcerting than the numbers are the job descriptions: a) Sustainability Director; b) Residential Communications Coordinator; c) Coordinator of Learning Immersion Experiences; d) Senior Specialist of Assessment; e) Director of Knowledge Access Services; f) Dietetic Internship Director; g) Credential Specialist; h) Director of Active Collaborative Engagement; i) Director for Learning Communities and First Year Success; j) Vice President of Student Success, and so the list continues, as if taken straight out of a Monty Python skit. As the authors tell us, these were taken randomly from a list of advertised positions in the *Chronicle of Higher Education*. Has this all been an inevitable result of the growth and comprehensiveness of what Clark Kerr called the “multiversity”? It appears more the case that many American universities have been applying the economic logic of specialization, following the general paradigm of “more is always better” with regard to education. But instead of being checked by the market controls of costs and benefits, universities have developed away from pursuing their basic tasks.

Some of the criticisms in the literature are controversial while others are frighteningly accurate. Yes, commercialization has taken place, and at many universities everything is for sale, sometimes down to an embarrassing level. All agree that this trend endangers academic quality, and represents the opposite of all cherished academic values, namely equal treatment, critical thinking and intellectual independence. The fact that some American universities are making serious academic concessions in admissions and are spending huge amounts of money to operate competitive athletics programs, all with the hope of gaining more than they invested, usually is vehemently criticized in discussions such as this.

And yet universities everywhere do have a lot to learn from businesses: for example, an awareness of opportunity costs, efficiency and the constant striving to improve the “services” they offer. Clearly efficiency in academia cannot be a goal in itself. But it should always be remembered that a more efficient handling of limited resources is what makes it possible to invest in other areas. Academics are generally self-motivated enough to do their best

to improve their own research. As Bok points out, however, “unfortunately, the same cannot be said of their teaching and educational programs. ... Instead, faculty members invoke all manner of rationalizations—academic freedom, professional autonomy, privacy—to resist efforts to subject their teaching to outside scrutiny” (Bok 2003, 26).

Still, Bok ends on an optimistic note: “Fortunately, researchers have been surprisingly resistant to the worst temptations of commercialism. ... By and large, therefore, academic norms have proved to be stronger than the lure of making money” (Bok 2003, 204).¹⁰

The very readable, beautifully written book by David Kirp (2004) supplies many illustrations of the points made by Bok and others. Kirp draws attention to the fact that today’s debate about commercialization falls in the same tradition as the age-long discussion between the values of the market and the values tied to the commons. Even the famous 1828 Yale Report, which featured the suggestion of eliminating the “dead languages” from the curriculum (the report rejected the idea, though it did happen a few decades later), can be seen as part of this ongoing debate. Stretching it a bit, one can see this discussion as part of the even older fight between the “ancients” and the “moderns.” According to the Yale faculty writing in 1828, the mission of the college was to promote “the discipline and the furniture of the mind” (Yale Report 1828). In Kirp’s formulation, the values of the commons are: “the commitment to test, not just replicate, the prevailing wisdom of the day; the pride of place given to need and merit, rather than the ability to pay, in determining who is to be educated; the contention that universities should be places for discovering, sharing and passing on knowledge rather than companies for hoarding and selling it; the idea, to revive a nineteenth-century metaphor, that one can speak of the soul of the university” (Kirp 2004, 261).

David Kirp correctly points out that we need to make certain distinctions when discussing the concept of the market: higher education does not operate on the principle of supply and demand; further, the “sellers,” i.e., the universities, are not indifferent towards the identity of the “buyers,” i.e., the students; moreover, non-profit institutions need and receive subsidies. In

¹⁰ It is uncertain whether Bok would be quite so hopeful were he to return to the issue of commercialization today. Clearly the strength of norms of research are—and have to be—much stronger in elite universities, like Harvard, where he served as university president.

our opinion, the analogy of producer/seller and consumer/buyer does not describe higher education, since a Bachelor's program, which must always have more to its aim than the pure transmission of information, is dependent to a great degree on the involvement of the students.

Many of the published books we cite here strongly criticize the commercialization that is taking place. The most prominent objection is that universities are, in the end, not businesses as they exist neither for profit nor are they based on a cost-benefit precept. Modern universities are, however, still similar to "businesses," in that they follow a certain competitive strategy regarding other institutions for example in terms of hiring practices. The constant need for resources—money, to put it bluntly—has come to exert pressure on many, if not all aspects, of university life to a degree previously unknown or imaginable. More importantly, the various "constituencies," i.e., students, faculty, donors, corporations, boards of trustees, politicians, all exert an influence on priorities that is often mirrored by their financial contributions.

The enormous pressure to raise money has also fundamentally changed the governance of universities. If those nominally in charge have to dedicate most of their time and energy to raising money, such as in the United States, the daily running of the university is not in the hands of its appointed leaders. Today the rule of thumb is that the higher someone stands in the university hierarchy, the more of his/her time is dedicated to raising money (whether in the pursuit of donors or in the constant groveling before government committees or wealthy foundations).

Perhaps the most far-reaching and pernicious impact of the ubiquitous need for fundraising is that admissions offices of universities relying heavily on revenue from tuition fees often have become the equivalent of marketing and sales departments.

The image of the university thus emerging is one in which the "idea" of the university has changed extensively over time, even since Clark Kerr's description of the multiversity. To some extent universities are "businesses," though they try at the same time to avoid full commercialization and make honest attempts to fulfill their traditional tasks. Universities today still preserve our intellectual inheritance. They transmit knowledge over generations, trying to respond to the needs of society at large, and to educate students for responsible citizenship in democratic societies.

In Kirp's formulation, the real question remains: "Can the public be persuaded that universities represent something as ineffable as the common

good—more specifically that higher education contributes to the development of knowledgeable and responsible citizens, encourages social cohesion, promotes and spreads knowledge, increases social mobility, and stimulates the economy?” (Kirp 2004, 263).

The Universalism of the Idea of the University

Discussing the idea of the university raises the question of why most universities in the world seem to follow one specific idea of what research and teaching are about. Irrespective of their financial status, the societies in which they operate, the local politics and all other contextual differentiae, universities have historically, through to today, a remarkable similarity in the values they hold.

This is especially the case for two of the most widely held values: the overriding importance of objectivity and universalism. As David John Frank and Jay Gabler (2006, 15) have written in a high-minded dogmatic tone, “Violations of the standards of objectivity and universalism disqualify an organization from being a university.”

If this were the case, not many institutions would still qualify as being a university. Naturally this does not mean (as the radical leftist critique of universities claims) that all knowledge is subjective and merely local, but it is certainly the case that objectivity has to be relativized in view of more than fifty years of research on the sociology of knowledge. The value and existence of universalism, essentially that a universal culture leads to uniform university structures and curricula, certainly looks compelling as a logical consequence of the nature of knowledge and the convergence of global society (Frank and Gabler 2006). It is this “universal culture” that explains the uniformity of university structures and curricula all around the world. For those who are committed to this thesis, the globalization of curricula thus is a logical consequence of the nature of knowledge and the convergence of global society.

Yet, this emphasis on the homogenizing force of globalization seems to ignore the hundreds of books, articles and newspaper analyses indicating globalization works both ways: it may have created an almost universal global flatland in the area of the economy, business, and in particular high-tech. Yet at the same time it is allowing for, if not fostering, all those aspects of local

culture and society (language, art, religion), which are not primarily governed by economic considerations, and which are either little influenced by global trends or even maintained in a defensive reaction against globalization or marketed purposefully for their otherness.

Higher education surely belongs, at least in part, to this latter domain. When curricula tend to show great similarity everywhere, we have to look for other reasons than simply globalization. We would suggest that the real “great equalizer” is the misconception of “universal validity” of Enlightenment values in those countries that simply copy foreign curricula. It is the same “what is good for them must be good for us” belief that led to the spread of other Western “institutions” and the logic that drives them, such as the automobile, irrespective of the indirect costs associated with them. Obviously in many ways academia is very diverse and intellectually independent. Yet, the global academic community exerts tremendous pressure on all universities to follow certain “universal principles” and to adhere to “academic standards” that are defined by the drumbeat of Enlightenment values. In fact adherence to these standards is the essential prerequisite for membership in the global academic community, but also for financial support from governments, funding agencies and donors, for accreditation and thus for the mobility of students, graduates and faculty. Global unity—within constrained boundaries—is thus produced through indirect pressure.

Where Are We Today?

In 1963 Clark Kerr (Kerr 1963, 14) said: “A university anywhere can aim no higher than to be as British as possible for the sake of the undergraduates, as German as possible for the sake of the graduates and the research personnel, as American as possible for the public at large—and as confused as possible for the preservation of the whole uneasy balance.” In general, this assertion still holds today, when properly interpreted.

The British University

If being “British” means placing an emphasis on undergraduate teaching, and placing great emphasis on education as a way of encouraging critical thinking,

such as within the framework of the traditional tutorial system in Oxford and Cambridge, then this ideal today is true more than ever. The total number of students in the world is larger than ever before and rising. Globally the university is the only relevant institution that is charged with educating the next generation of concerned citizens for coping with the problems of our globalized world. Hence, getting undergraduate education right is of crucial importance.

The German University

If German means research-oriented in all disciplines—whether applied or not—then this represents a global requirement, best seen in practice today in the United States. Thus, Flexner’s assertion that research is a central part of the idea of the university remains valid. However, an undergraduate education in terms of the New Enlightenment is no less important for those who will pursue an academic career as it is for the bulk of the student body that will choose other ways of life. The university, dedicated to conducting specific high-level research aimed at solving social problems, is part of the overall research orientation and fulfills a vitally important task of the university. As already mentioned, research generally cannot be guided or influenced, but the creation of new research areas can be planned so as to invite young scholars of a heterodox bent to work on them. It is one of the new tasks of the university to pave the way for young researchers and to defend their careers even if the elders of their disciplines oppose change and innovation. Private foundations could play an important role in this. We should remember that 60 to 70 years ago the Rockefeller Foundation single-handedly, and in the face of opposition from most of the academic establishment, decided to establish and support molecular biology, with lasting results.

The American University

If “American” means “multiversity,” with its service character, with its concern for the public interest, with its egalitarian and democratic principles that contradict the elite character of the research university, which exists as only

one part of the overall institution, then indeed this is a model for the university which is with us still today and which is more relevant than ever.

What we object to, however, is Kerr's last half-joking claim that the university has to operate on a certain level of confusion in order to integrate all of these identities. Hans Weiler, building on Robert Merton's classical study of sociological ambivalence, drew up an impressive list of "ambivalences" all inherent to the life of the modern university (Weiler 2005). One that does not appear on his list—and is very central for us—is the inherent ambivalence between the quest for coherence and the need to embrace contradictions (Elkana 2006). What is needed is not confusion—that is at best tacit knowledge—but the realization and verbalization of the contradictions inherent in all aspects of university life.

One goal remains clear, however: research should not be subservient to government intervention. It is also clear that unlike in the time of Humboldt, when the state was supposed to guard and ensure academic freedom, the state today is "seeking ways to direct university systems and exploit their usefulness for national ends" (Shattock 1992, 134). But it does not follow that there should be a strictly permanent separation between academe and government and the private sector. Today's complex problems often require the kind of comprehensive understanding that is nurtured by a career in transdisciplinary research and in praxis. The appointment of Nobel Prize winner Stephen Chu as Secretary of Energy in Obama's administration is a case in point, as is the move of Anne-Marie Slaughter from her position at Princeton University to head of Policy Planning at the State Department. Lawrence Summers' movement between being Harvard's president, research and teaching and participation in decision making and office holding in the federal government points in the same direction. There are good reasons to keep the state and its actors involved when it comes to formulating the research agenda. Not only is the state the primary source of funding for expensive research conducted at universities in most countries. It is also keenly aware of the grand social challenges that the universities should address and usually possesses specific knowledge that helps to determine how these problems should be approached. Therefore the academy's independence must be secured in a different way.¹¹

¹¹ See in this context Michael Young (1958).

Ultimately, Kerr's vision can be reduced to a few, unoriginal though optimistic generalities. He predicts the following: the growing struggle of the young to secure resources for higher education in an ageing society; the explosive growth of the biological sciences; the further disintegration of the university, which has already become fractionalized and is set to fragment even further; the disappearance of loyalties to institutions and in general a world in which everyone seems at war with everyone else (Kerr 2011).

Still there are powerful forces of social solidarity at work; in spite of rampant wars and terrorism, and local massacres, more countries today are democratic than ever before, and as a share of the overall population fewer people are hungry than ever before. In fact, more mutual cooperation and assistance exists between societies than ever before.

These factors represent the background before which the university of the 21st century must derive its purposes, its ideals and goals, as well as its curricula. As Jürgen Habermas reminds us, we should not forget “the indubitable historical progress that exists in all those dimensions in which human beings can learn” (SSRC Website 2010). Despite claims and evidence to the contrary, there has been progress in the world in areas of morality and the rule of law (e.g., Rifkin 2011).

All the shortcomings of the post-modern university, reflected in its moral failures—the unbridled pursuit of careers, the unrestricted craving for status, fame and money, the careless neglect of undergraduates because of other, false priorities, the over-commercialization—do not represent “natural” problems but rather institutional problems that can be corrected through proper leadership. These problems are not independent of the fact that all universities—especially in countries with a sound social welfare system, but also in America—are underfunded (at least as long as they operate within the framework of their current organizational and technological structure). These problems are compounded by budgetary pressures, but the lack of intellectual leadership, misplaced priorities and ill-aligned incentive structures lie at the heart of today's university's problems.

Where does all this leave us in terms of the 21st-century “Idea of the University”? Today's post-modern multiversity is a fractured collection of communities, each with its own “idea of the university” with little today holding these communities together—whether it is a common heating system as Flexner had joked about, or the shared plight in the lack of parking spaces, as Kerr had ironically remarked. But a typical chaos-type of process

is underway. While the image becomes more and more fractured and even blurred, a new order seems to gel. Once we come up with a new list of aims for the university, and a new list of basic principles underlying all curricula and teaching, we shall soon realize that members or participants of the post-modern multiversity will in fact be able to share in common goals for the 21st century.

We need to keep in mind that in spite of the diverse critiques of the university as it is today, and the claim—including ours—that in its present form the university is not up to performing the tasks presented to it by the realities of the 21st century, the university is in fact a success story that is historically unprecedented. Peter Scott expressed it accurately with the following: “The past half-century has been the European university’s fourth, and perhaps greatest, age”; moreover, “apotheosis does not seem too extravagant a word to describe the achievements of the European university since 1945” (Scott 1988).¹²

Having become a multiversity, having opened up to new ideas—and actually having become the creator of new ideas—having responded to a great variety of social demands, the university now occupies a much more central role in modern society than ever before. It is actually this very success, which makes the 20th-century university open to the new demands and criticisms in the 21st century.

All of this points to the fact that the university has to undergo fundamental changes indeed. Yet, at the same time many authors are repeatedly reminding us that today, more than ever, the university must serve as a stabilizing institution to protect and maintain traditions and values without becoming trapped by dogma. Our recommendation of bringing theory and practice together could be an overall contribution to the university and not simply a means for improving the quality of studies for the Bachelor’s degree.

The “information society,” which wants to evolve into a “knowledge society,” cannot tolerate the separation of the technical/practical from the

¹² Scott—somewhat provincially—uses the idea of the European university. While acknowledging that America has become the center of higher education in terms of science and scholarship and ignoring the fact that by now the same university system has become genuinely globalized, what he in fact says could have been asserted about the 20th-century university in general, dropping the qualifier “European” altogether.

theoretical.¹³ Universities should neither be concerned only with abstract knowledge nor should professional schools concentrate only on technical training. Teaching based on theoretical reflection on real-life problems in all institutions of higher learning could help us overcome the inauspicious separation of theory and practice. The goal should be that advanced education should neither represent self-serving ambitions nor exclusively the training of human capital, but rather the creation of engaged, concerned citizens who are both professionally qualified for a competitive world as well as critically predisposed in confronting the status quo. Active engagement with unforeseen, dynamic and contradictory realities yields an intellectual attitude that incorporates reflective engagement with life's realities. We believe this is the basis of the "idea of the university" for the 21st century.

¹³ In the post-World War II period, many institutions were founded to create technical knowledge, such as the *Instituts Universitaires de Technologies* in France, the *College of Advanced Technology* in Great Britain, the German *Fachhochschulen* and the *Hogescholen* in the Netherlands. Since their creation, these institutions have moved away from their original purpose to become more in line with the university model. The technical colleges in Great Britain were made into technical universities in 1965, and the polytechnical schools followed suit in 1992. German *Fachschulen* often call themselves *Hochschulen* or *Universities in Applied Sciences* in order to avoid the stigma of being considered second-rated institutions. All these institutions offer today what, in terms of the Bologna process, would be called higher applied education leading to a Bachelor's degree if students earn enough credits specified by the European Credit Transfer System (ECTS).

CHAPTER 3

THE AIMS OF THE UNIVERSITY

The discussion on the aims of the university is closely tied to that on the “idea” of the university, though the concepts are not identical.

For some decades now it has been something of a trend amongst intellectuals in the United States and elsewhere to write about the failings of our universities. Many of these works have almost become classics in their own right. In Germany this same discussion began in the 1960s after Georg Picht (1965) warned about the education crisis and Ralf Dahrendorf published his book, *Bildung ist Bürgerrecht* (1965), literally “Education is a civic right.” In the United States, the report entitled *A Nation at Risk* (1963)¹⁴ is worth mentioning here. The most popular and most widely read of these books was Allan Bloom’s *The Closing of the American Mind* (1987). All of these publications, as well as many others, warned in one form or the other of insufficient educational opportunities and a “rising tide of mediocrity” in schools and in universities.

Derek Bok’s thoughtful book *Our Underachieving Colleges: A Candid Look at How Much Students Learn and Why They Should Be Learning More* (2006) is of particular relevance in this regard. As Bok points out, most of the prominent books highly critical of higher education were written by eminent scholars from the humanities who are not experts in the field of higher

¹⁴ The report was published by the National Commission on Excellence in Education. The subtitle of the report was “The Imperative For Educational Reform”; the authors drew attention to facts which, partially as a result of this report, are well-known today: in 1983, 23 million American adults were deemed functionally illiterate; America falls behind most other industrialized nations on most criteria; there are signs of continuous decline since 1963; short supply of skilled labor; remedial education supplied by employers costs billions, etc.

education, and who do not know the literature on research in the field, nor take a comparative perspective in their work. Instead, these authors offer simple perspectives sometimes mixed with or entirely dependent upon personal experiences or anecdotes repeated from other sources.

It is not as if we, or Bok, disagree with the analysis concerning the massive problems in the area of higher learning or with the acute need for improvement. The real problem is that most of the critics go no further than describing, in at times a malicious tone the problems of the university rather than tackling the question as to what should be the true aims of the university. We believe that the university's problems in the 21st century cannot be solved if we are unclear about the larger purpose that motivates reform.

The University's Purposes—A Historic Perspective

It has always been acknowledged that the task of the university, sometimes called “mission,” is manifold, although that meaning has evolved over time. During the 19th century a central meaning involved the acquisition, creation and transfer of universal knowledge—the already known—combined with moral knowledge. Scientific and philosophical exploration, the uncovering of the unknown, was marginalized, where it existed at all. This view of the aims of the university was, in part, challenged by Wilhelm von Humboldt's desire to create a research-oriented university.¹⁵

The university of Berlin was deeply influenced by the reform universities of Halle and Göttingen where Schleiermacher had taught and Humboldt had studied. A coherent concept was the end result, conceived by Schleiermacher and then rendered into an administrative system with pertinent structures by Humboldt in his capacity as “head of the section for ecclesiastical affairs (‘Kultus’) and education in the Ministry of Interior.” In the following argument we follow closely the succinct formulations of Christoph Marksches (2010). Humboldt himself was deeply concerned

¹⁵ Humboldt's views are a perennial topic in Germany, but not only in Germany. Much of what he actually said, however, is often cited in truncated or rather misquoted form, what Mitchell Ash (2006) calls the “Humboldt Myth.” It is also important to remember that what is often ascribed to Humboldt was the result of the thinking of several others around him, among them his brother Alexander von Humboldt and, especially, the theologian Friedrich Schleiermacher.

about trying to understand the essence of the human being. Education in this sense should emphasize intellectual, moral, and aesthetic forces—in short it aims at educating the entire human being—and this should take precedence over professional training.

To fully understand, then, what the Humboldtian university was about, one must understand the essential ideas that formed it: the interrelationships among solitude, freedom and social relationships for scholars; the freedom to teach and learn; the unity and the differentiation of science; learning through academic study; and the unity of teaching and research. Taken together these became the guiding ideas about the aims of the university, ideas which continue to resonate today.

Einsamkeit und Freiheit —Solitude and freedom

Freedom and solitude were essential for scholars to work. Only when they were allowed to have these could they achieve high levels of original scientific knowledge. However, these were bounded conceptions. In fact, very few scholars needed genuine solitude; those that did, should be allowed to have it. Freedom was bounded by necessity, the fundamental fact that human beings lived in society and thus collegial collaboration was essential (Humboldt 2002 ed., vol. IV, ch. 29; see also Gerhardt 2007; Shils 1992).

Lehr- und Lernfreiheit—The freedom of teaching and learning

This implies that faculty and students should enjoy complete freedom in choosing their intellectual activities. The concept was originally meant as a protection against influence and censorship from the state. The principle was also used to allow professors and students to pursue subjects in greater depth; freedom to teach meant the faculty could offer advanced courses based on their scholarly interests, while freedom to learn would lead in the same direction. In today's universities, this call for freedom unfortunately has led to a situation in which students often are not offered a coherent curriculum but a rather eclectic collection of course offerings that not coincidentally closely align more with the research interests of their professors than as a signal to pursue topics in depth. Building a coherent curriculum—what we

consider essential in the reinvention of the university—would, however, require a critical mass of professors reaching agreement on what the curriculum should be. Moreover, they would have to abide by that decision, teaching not whatever strikes their fancy, but what is required.

Einheit und Differenzierung von Wissenschaft
—The unity and differentiation of science

In his two memorandum to establish the new university in Berlin, Humboldt provides little detail on the unity and differentiation of science (Humboldt 2002 ed., vol. IV, ch. 29). However, he does mention the unity of knowledge—“Einheit der Wissenschaft.” The idea goes back to Kant’s “Streit der Fakultäten”—the conflict of the Faculties¹⁶ and to Schleiermacher’s epistemological reflections, but finds a practical expression in Humboldt’s claim that the “... geistige Wirken in der Menschheit nur als Zusammenwirken gedeiht” (intellectual endeavor thrives only through cooperation) and that this must be reflected in the way the university is organized. This is especially noteworthy when remembering that in German “Wissenschaft” stands for all branches of knowledge, i.e., that there is no distinction within the term itself between the natural sciences and the Geisteswissenschaften—the humanities. So it seems logical that Humboldt would claim that “... jede Trennung von Fakultäten der acht wissenschaftlichen Bildung verderblich ist” (any separation of the faculties is the ruin of scientific/academic learning). This may well be read as an early call for interdisciplinarity.

Bildung durch Wissenschaft—Learning through academic study

There are several ways to interpret this saying. One way to understand it is that students’ minds are shaped through Wissenschaft, or academic training. Another way is to read it as meaning that pure science, or pure academic study, has primacy over specialized professional training. According to Kant (1979 ed.), the philosophical faculty is independent of interests tied to the

¹⁶ As to Kant’s (1979 ed.) late work “Der Streit der Fakultäten,” suffice it to say here, that without it, in all probability, neither Schleiermacher nor, for that matter, Humboldt would have made their valuable contributions.

state,¹⁷ while education in the professions reflects the needs of society. In that sense, only the philosophical faculty is “pure” science, or academic study, defined as the pursuit of truth for its own sake. However, there is no such explicit statement found in Humboldt’s work; what he does say is that universities are engaged in the study of unresolved scientific problems and thus are involved in research (Humboldt 2002 ed., vol. IV, ch. 29). In this context, Humboldt has a comprehensive, and typically German, understanding of science that explicitly includes the humanities. This understanding of *Wissenschaft* still finds expression today in the “Faculty of Arts and Sciences” that one finds at US universities.

Einheit von Lehre und Forschung—The unity of teaching and research

This is probably the most quoted principle of Humboldt. It certainly does not mean that every professor has to divide his or her time in equal parts between teaching and research. In the passage from which this phrase is taken, Humboldt explains (Humboldt 2002 ed., vol. IV, ch. 29) that “das Verhältnis zwischen Lehrer und Schüler wird daher durchaus ein anderes als vorher. Der erstere ist nicht für die letzteren, Beide sind für die Wissenschaft da” (the relationship between instructor and student will be thoroughly different than it has been. The former is not for the latter, but both are here for science). While not every researcher is necessarily a good teacher, every good teacher has to do some research. This does not mean, however, every professor must be doing ground-breaking research at the frontiers of knowledge that culminates in publications.

The importance of Humboldt’s assertion of the unity of teaching and research cannot be overestimated, for it underlay an essential aspect of the modern university. And yet the frequently repeated phrase, “our professors are both researchers and teachers” reflects an idealized view of what has occurred and, in environments where professors actually do little research, it is itself a hollow phrase. Only in the context of doctoral education, where scholars work with 5–6 doctoral students, is there a true unity of research and teaching. In view of the growing specialization that has occurred in

¹⁷ Kant speaks of *Regierung* (government); we would say demands of society. That Kant’s name is never mentioned in Humboldt’s memoranda should not surprise us in view of the political dislike of the Prussian court for Kant’s views.

higher education over the past 50 years, we cannot continue to adhere to an idealized conception of the unity of teaching and research. This unity must be newly conceptualized for the 21st century.

Humboldt's Relevance Today and What the 19th Century did not Know

Tensions between Humboldt's ideals and reality have always existed. Humboldt's ideal of basic or pure science was not immediately accepted everywhere—for example, it took a long time until Oxford and Cambridge embraced that ideal—it clearly had a formative influence on the modern university, in the United States, and in the rest of the world.

In addition, it should always be remembered when referencing Humboldt's concept of the university is that he was designing an institution that was meant to cater to less than 1 percent of a given age-cohort. With regard to quality and quantity, completely different measures existed in his time and he certainly did not have in mind what later became the so-called mass university.

So in estimating the Humboldtian university's relevance to today's universities, we are left with a fundamental question: What remains given that so much has changed? If taken verbatim, very little. Yet, when appropriately reformulated, much of what Humboldt stood for can still serve as a guideline today. No question that for those who will become researchers, it is important that their teachers are informed on the current state of research in their areas. On the other hand, for the great majority who are going into the professions—what is generally described as the labor force—it is not at all self-evident that their teachers must be researchers—or at least not the kind of researchers that regularly publish original findings. Already today, non-researchers teach a good part of university courses in the United States, whereas many top researchers do minimal teaching. In summary, we can say that the aim of academic teaching has endured, though the context has been fundamentally transformed over time.

That the state, beyond the financing of universities, should have no right to interfere in academic matters is as true today as it was then—though this is clearly contested territory. This proceeds from the idea that universities should try to become as financially independent of the state as possible, for

example by becoming “Stiftungsuniversitäten” (endowed universities). What this means is a move towards the American model where an independent Board of Trustees becomes the quasi-“owner” of the university. This model, while evidently not perfect, is turning out to be the most successful model so far.¹⁸

Humboldt demanded “the unity of Wissenschaft” in order to indicate the interrelatedness of all the disciplines. He was challenging the rigid divisions, which, then as today, divided up the university. This challenge is of acute relevance today, as the need for interdisciplinarity and the mutual dependence of many disciplines today is much clearer than it was in Humboldt’s time. Reviving the concept of “the unity of Wissenschaft” thus is more important than ever in order to put an end to the intellectual compartmentalizing brought about by ever more specialised disciplinary research.

However, trying to understand a complex and messy world through academic study in the natural as well as the social sciences—something of great importance for our society today—was not part of Humboldt’s vision. Indeed, for us, the burning societal issues of the day are intellectual challenges of the highest order that should be given an important role in the education of students in all disciplines.

The Liberal Arts Tradition

In 1925 Abraham Flexner published “Purpose in the American College.” He wrote: “Grant me, if you will, that this—the training of minds—is the most serious and important subject to which college can address itself.” By “training of the mind” he refers to all aspects of serious research and research-oriented teaching. Flexner did not share Cardinal Newman’s extreme view that “useful knowledge is trash.” Flexner’s point is that while character-formation and instilling the values of good citizenship are indeed aims of college training, these values “... can not be made the specific ends at which instruction and study aim, either in the college or anywhere else. Character and citizenship are ... by-products of the standards of intercourse set up and maintained by the group ... colleges are endowed, laboratories and libraries

¹⁸ For a concise international comparative analysis of different “board of trustees” models, see: Müller-Eiselt (2010).

are provided to select and train intellects; but the conditions under which faculty and students live and work—these must be such that, while the college is doing its peculiar and proper job—the training of minds—fine ideals of social and individual relationship are exemplified” (Flexner 1925).

Flexner is even more rigorous when he emphasizes that being happy and joyful, and indulging in sports and other social activities has to be secondary to the primary purpose of higher education: “Colleges are not founded and supported to make a fortunate group of boys and girls happy.” On the other hand, Flexner, at his complex best, adds, “I am pleading only for seriousness of intellectual purpose—and seriousness of intellectual purpose is not inconsistent with playfulness ...” (Flexner 1925).

In the United States, the “aims” of higher education are often summarized as “providing students with a liberal education.” The concept is old, but still enjoys a great amount of currency. Indeed, there are excellent liberal arts colleges and undergraduates schools of arts and sciences within elite universities, primarily in the United States, operating on this principle and they are setting the standard of quality in higher education, even if they cater only to a small percentage of the annual cohort that goes into higher education.

The concept is usually defined by several basic ideas: a) a liberal education appreciates knowledge for its own sake¹⁹; in this, it is the exact opposite of a commercialized, training-oriented education. It emphasizes a broad education, and the fact that we are talking of “arts and sciences” is tell-tale as we are talking of both the humanities and natural sciences, or the philosophical faculty and the natural and social science faculties. According to George Fallis (2004, 8), a liberal education aims at “creating free and autonomous individuals unbound by a priori strictures.” In the final chapter of his *Multiversity, Ideas and Democracy* (2007), Fallis comes to the important conclusion that undergraduate education, more so than doctoral and professional training, is in danger. This view we fully share and this should be alarming for anyone, for ultimately the quality of research hinges critically on the quality of undergraduate education.

Fallis also emphasizes that the university as an institution is of critical importance for the vitality of a democracy. In 1944, in the midst of WWII, the Spanish philosopher, humanist, and statesman Ortega y Gasset published

¹⁹ Although Leon Botstein, President, Bard College, convincingly argues that this makes little sense for learning always has a purpose, if only that purpose is pleasure.

The Mission of the University (1944). In it he describes the mission of the university as approaching “the problem of general education” in a way that would allow us to “confidently strike any third world war off the calendar” (Gasset 1944, 1). In other words the task is to educate enlightened citizens for the global community, and to prevent each of us from becoming part of the unscrupulous or blind “masses.”

In the rest of the world—in Europe, India, China, Japan, Latin America or Africa—this educational tradition does not exist. Only recently have these types of institutions begun to be founded outside the United States in the form of experimental colleges. All in all we have an uneven image: on the one hand, we see the increasing demise of Liberal Arts education in the United States (e.g., due to intense professionalization and specialization of the curricula (Ferrall 2011)), and on the other hand, we see an expansion of this kind of education in Europe and Asia (Wende 2010).

Higher Education for the “New Global Century”

In 2007 the American Association of Colleges and Universities (AAC&U) made an impressive attempt to outline the main tasks of contemporary higher education in the so-called LEAP Report: Liberal Education and America’s Promise (AAC&U 2007; see also www.aacu.org/leap). The Report identified four essential “Learning Outcomes,” as listed below.

Knowledge of human cultures and the physical and natural world

In terms of curricular content, the AAC&U calls for engagement with the big questions, both contemporary and enduring through study in the sciences and mathematics, social sciences, humanities, histories, languages, and the arts.

The idea is that “college courses can help students explore the difficult issues of our world, the ones where both the nature of the problem and the range of solutions are actively contested” (AAC&U 2007, 39). This demand is rooted in the belief, which we subscribe to, that “[a]ll students—including those least prepared—learn best when they can see the point of what they are doing. Illuminating real-world implications can help students discover

the excitement and the benefits of powerful learning” (AAC&U 2007, 33). The rationale behind this broad problem-centered approach to liberal education, as opposed to a conception of higher education that is narrowly focused on teaching a certain skill-set, is that it will prepare students for the responsibilities of citizenship within a global civil society as well as the job market of a global economy.²⁰

Intellectual and practical skills

Amongst the intellectual and practical skills students are meant to acquire during the course of their studies are inquiry and analysis, critical and creative thinking, written and oral communication, quantitative literacy, information literacy as well as teamwork and problem-solving. Merely sitting in lectures and seminars will not be enough to acquire such a broad set of skills. Hence, the report calls for novel as well as established forms of “inquiry- and project-based learning—including multiple opportunities to work, independently and collaboratively, on projects that require the integration of knowledge with skills in analysis, discovery, problem solving, and communication” (AAC&U 2007, 33).

Personal and social responsibility

It often appears as if educating students to think critically is the academy’s main contribution to the public good. Yet, higher education is not just about an individual’s gain in knowledge and skills. It is also about instilling a sense of civic responsibility through active involvement with diverse communities and real-world challenges. According to the LEAP report:

²⁰ Anticipating potential critics the authors do not fail to acknowledge the challenge of achieving such an ambitious objective: “Self-evidently, four years of study is not enough time to achieve such breadth and depth of knowledge. But students are spending at least sixteen years—if they complete a bachelor’s degree—in the combination of school and college. If educators map goals for learning in these core areas across this extended sequence of study, the goals become attainable” (AAC&U, 2007, 34).

First-year and general education courses should intentionally help students grapple with the kinds of “big questions” they will inevitably face both as human beings and as citizens—about science and society, cultures and values, global interdependence, the changing economy, and human dignity and freedom. The general education curriculum is also a place where students can explore the values, institutions, and aspirations that are basic to democracy, examining these complex questions through multiple and cross-disciplinary lenses: philosophical, empirical, historical, cross-cultural.

Both service learning and experiences with diversity are to be used to convey and encourage local and global civic knowledge and engagement—including a rich understanding of the values and struggles that have established democratic institutions and expanded human freedom and justice—inter-cultural knowledge and competence and a capacity for ethical reasoning and action. Regarding the current state of affairs the report maintains that “[a]s with so many other high-impact educational innovations, these efforts to prepare students for active citizenship in diverse communities still hover on the margins of the mainstream academy” (AAC&U 2007, 38).

Integrative learning

Students should not simply be bombarded with heaps of conflicting information in the name of interdisciplinarity. The curriculum should be designed in a way that actively supports “synthesis and advanced accomplishment across general and specialized studies” (AAC&U 2007, 12). Such synthesis should allow for a general “understanding of economic forces, other cultures, interdependence, and political dynamics” (AAC&U 2007, 34). Moreover, the report encourages “second-language competence and direct experience with cultural traditions other than one’s own” (AAC&U 2007, 34) as becoming a permanent part of higher education curricula.

Assignments should be designed in ways that go beyond jumping through “multiple-choice test” hoops. Students should be able to define a given task, explain its significance, test alternative solutions, and take actions based on their own judgment. “Some of these learning experiences can take the form of independent study; others should be carefully designed experiences in collaborative learning with diverse partners. Every student should prepare

for both life and citizenship by working frequently on unscripted problems, and by building capacities to function as part of an effective team. Fostering this kind of informed practical judgment should be a priority for every academic field” (AAC&U 2007, 36).

Practical experiences are described as “rich opportunities for connecting knowledge with choices and action”; however, it is rightly pointed out that these often remain “essentially ‘add-ons’ in which students are left to their own devices for any insights gained” (AAC&U 2007, 36). To overcome this view of practical experience as an accessory to scholarly pursuits, these should be “integrated into the curriculum, and efforts to strengthen the quality of students’ learning from such experiences should become an integral part of a contemporary liberal education” (ibid.).²¹

Learning Objectives in a Curriculum Reflecting the New Enlightenment

First of all we would like to state that we fully endorse the suggestions made in the LEAP report, which is one of the boldest, most comprehensive yet balanced document of its kind that we have come across.

This is not to say that it is all-encompassing or that it could not be improved upon. It touches on many of the issues that are raised throughout this book, but either overlooks or—possibly for political reasons—fails to state a number of important points.

Our first and most important criticism of this report is its failure to address the necessity of rethinking the legacy of the Enlightenment. The complexity of the world is only dealt with in passing, and more as a rhetorical point than as a substantive concept. The issue of creating an awareness of non-linear processes and phenomena goes wholly without mention and therefore the messiness and uncertainty of the present age is underemphasized.

Moreover, the issue of rhetoric as a discipline, the capacity to engage in skillful communication, is treated as a function of learning. However, rhetoric involves not only skillful verbal communication. Rhetorical thinking is a

²¹ Besides these “Essential Learning Outcomes” the report has much more to offer, notably numerous examples of institutions demonstrating good practices as well as additional recommendations, for example, regarding assessment and quality assurance.

certain frame of mind, an ability to think dialectically. It is not about tricking people, but about persuading them with clear evidence-based arguments.

While a great deal of what is called for seems like an apt description of a transdisciplinary approach to teaching, the concept is not mentioned explicitly. Transdisciplinarity, according to Manfred Max-Neef (2005, 15), one of its thoughtful proponents, is “more than a new discipline or super-discipline”. It is actually, a different manner of seeing the world, more systemic and more holistic. To us it seems as if this is exactly what the AAC&U is calling for, without explicitly formulating it as such.

Last but not least, there are a few aspects that are implicit in the LEAP report that are self-evident to an American audience, but may be overlooked by a non-American one. It is with such a point that we would like to begin our own (complementary) list of aims for contemporary high education. Stefan Collini (2012, 51) points out correctly that writing on the objectives of higher education often leads to a kind of rhetorical overkill to the extent that there is an enormous imbalance created between the declared objective (“creating a better person”) and the 3–4 year time period for an education leading to a bachelor’s degree in what is often a mostly one single academic discipline. This imbalance cannot simply be wished away, but we argue that in order to accomplish the objectives named in the following it is necessary to reform the curricula according to the guidelines presented here so that all students will enjoy a healthy amount of general university education.

We are also of course aware that we are dealing with idealist objectives. Yet we believe that it is legitimate to consciously set the objectives so high that universities, or rather those within the universities, develop the determination to do what is possible in order to move toward these objectives. These objectives are spelled out in the following:

Educate Everyone for “Concerned Citizenship”

Universities should have the ambition to educate—at least in theory—all members of society in a way that enables them to become responsible, concerned, problem-aware citizens. This is another way of saying that we should educate our students to acquire what Pierre Bourdieu (1986) and James S. Coleman (1988) termed “cultural capital” and “social capital.”

Undergraduate education in our view should feature a strong personal development component. Instead of merely educating for the professions—which bachelor’s degrees for the most part fail to do anyway—this component should entail an education in moral reasoning, in independent thinking, in a sustainable social life and in a critical and reflective approach to knowledge. Ideally, it would form graduates who are aware of their personal and social responsibility, who possess intercultural competence, who approach complex issues with a long-term perspective and who lead lives that are not merely successful, but significant.

Is this nothing but a naïve hope? We do not think so. The social contract between society, government and universities, however, will have to be reformulated in a way that acknowledges even more clearly the quality of education as a public good. In spite of what some professionally pessimistic cultural critics say, we contend that every individual—independent of what it is that he or she does for a living—would lead a richer and more rewarding life, if he or she were “better” educated. In fact, in today’s world it is almost immoral to educate an individual for a narrowly defined job. What exactly “better” means will clearly be a contested issue. But this is exactly the kind of debate that those in charge of the curriculum, as well as society at large, should be having.

Train the Next Generation of Researchers

Besides the education of citizens, universities also have another responsibility: they have to prepare future researchers in all fields to become stewards of their discipline. Only a small percentage of the student population will go on to conduct cutting edge research. While this will require highly specialized training to move toward the frontiers of knowledge, future researchers should share an epistemologically broad education with all other undergraduates. Beyond training in the foundations of two or more disciplines they would also have to confront real-world problems in discussion-based interdisciplinary seminars. Most of their advanced research training would take place at the doctoral level. In fact, we maintain that receiving a broad and epistemologically rich foundation at the undergraduate level is a prerequisite for producing groundbreaking, technically sophisticated research.

It is important to stress that this is essential not just for their moral development, which it is, but also for their cognitive development. Working with intractable real-world problems helps to build a critical awareness of the limits and limitations of knowledge. The anti-dialectical, positivist Enlightenment perspective typical of contemporary curricula fails to impart the “cognitive dimension of citizenship.” Without a fundamental understanding of non-linear developments, it becomes difficult for a society to accept the necessity of durable and effective measures in matters such as climate protection. The standard reductionist curricula do not provide students with a realistic image of the messiness and complexity of the world we live in and thus do not convey an understanding of the value-ladenness of much of human (including scientific!) judgment. Such an understanding, however, is not only a characteristic of smart citizens, but also of smart scholars. In the apt phrase of Drew Faust, President of Harvard University: “Universities are meant to be producers not just of knowledge but also of (often inconvenient) doubt” (Faust 2009).

Conceive Undergraduate Education as Substantially General Education

Training in fields such as medicine, engineering, law, nursing, ministry, teaching, etc., should follow several years of general education.

So far, however, this is a distinctly American setup and has not seen widespread adoption in most of Europe, Israel, or the multitude of new universities in India and China. In Europe and especially in Germany it has long been presupposed that secondary education is doing such a formidable job that, upon graduation (the “Abitur”), students are intellectually and morally ready for immediate training in the professions. This assumption is profoundly mistaken. Allowing 18-year-old, relatively immature young people to enter into the fields of medicine, law, engineering, and the like, without the necessary intellectual and moral preparation borders on irresponsibility, as it poses the danger of creating those single-minded zealots that Cardinal Newman warned against.²²

²² In some countries, the situation is even more complicated with three or more years of military service wedged in between secondary school and higher education.

Make the Study of Values a Cornerstone of an Education in Critical Thinking

All educators seem to be able to agree upon one thing and that is education in general and higher education in particular should enhance an individual's capacity for critical thinking. As such, critical thinking is basically the lowest common denominator of all curricular debates. It is also at the core of the American Liberal Arts tradition. As Richard A. Lynch (2003) put it in a short but lucid essay on the subject: "Critical thinking is perhaps the most general term for the intellectual abilities that are supposed to be characteristic of the liberally educated person."

Lynch is right to point out that true critical thinking goes beyond what he calls a "minimalist"—that is a purely cognitive—conception. Critical thinking is more than "the ability to recognize a fallacy when you see one." He goes on to argue that: "Good critical thinking is not value-neutral, nor is it merely instrumental. It is intimately connected with a) values; and b) attitudes." Comprehensive critical thinking in his view "challenges and reevaluates the very values that it takes as its basis for judgment. One important component of critical thinking, then, is some understanding of one's starting points—who one is, what one believes, and why. Critical thinking is thus both reflective and evaluative. It raises the possibility of both the critical thinker and her milieu being challenged, unsettled, and perhaps changed." It is defined by "an attitude of reflective openness" and "a genuine willingness to consider new perspectives, to try to understand them from within, and to step outside of one's own views long enough to acknowledge that one's perspectives, assumptions, and outlook are vulnerable, perhaps even mistaken or incomplete" (Lynch 2003).

We fully agree that if critical thinking is to be more than "a mere analytic tool applied to externally determined ends," students have to be educated in a way that goes beyond training their capacity for judgment. A true education for critical thinking teaches them to challenge the very values on which their judgments are based. Lynch concludes his essay by pointing out that this approach "ought not be the sole province of 'critical thinking' courses. It should be an aim of courses throughout the undergraduate curriculum" (Lynch 2003). The interdisciplinary seminars we recommend, focusing on real-world issues, provide an ideal environment to practice this form of critical thinking throughout the undergraduate curriculum. But efforts

should be made to design all courses in such a way that they operate based upon this rationale. Critical questions concerning the values underlying a particular judgment can be found in all contexts. Bringing them to the attention of students therefore is the task of all educators.

Create an Intellectual Fusion of Theory and Practice

Higher education should convey intellectual and practical skills. These range from verbal and written communication skills, to rhetorical framing, information-evaluation and a capacity for problem-solving. One of the many ways to characterize these various skills and competencies comes from Brent Rubin (2004, 64–65). His list includes “personal,” “communication,” “organizational,” “cultural” and “substantive” competencies.

The language of “skills” may sound somewhat technocratic, but it conveys the essential message. What is important is that theory, method and analysis, as well as practical applications, should not be artificially kept apart but combined to enable a broader idea of application.

The *Reacting to the Past* series published by Norton²³ is an especially interesting example from the humanities of fusing theory and practice. In format, students reenact historical debates. Through these reenactments they not only learn communication and rhetorical skills, but also how these skills can be used for good as well as for evil. Students show an increase in emotional empathy, as compared to students who do not take such courses. Similarly, they are more likely to believe that human characteristics are malleable rather than fixed. It is the task of educators “to ensure that students do not stop with learning the skills of debate, but proceed to ask what the skills of debate are for.” In short: they learn to “privilege dialogue over debate” (Slater 2005).

Even closer to what we envision to be the purpose of the real-world seminars is the idea of the laboratory developed at Bennington College. In the words of Bennington’s former President Elizabeth Coleman (2007), they are meant to demonstrate that in the “the contentious, messy, contingent, constantly changing world of the practical, unlike that of the theoretical,

²³ Available at <http://books.wwnorton.com/books/book-template.aspx?ser=Reacting+to+the+Past>.

no one is an expert and, while there are those with a vast range of experience, no one has the answers. ... [T]o prepare for the world's diversity, all students need frequent opportunities to engage in collaborative interaction with people whose assumptions and life experiences are different from their own." It is the task of comprehensive higher education to put students in a position that allows them to successfully navigate their personal, professional and social environments at a time in which their lives often span continents and their career paths have become utterly unpredictable. Borrowing from Claude Lévi-Strauss (1966), higher education needs to educate intellectual bricoleurs.

Lee Shulman and his former colleagues at the Carnegie Foundation for the Advancement of Teaching (2005) have shown that many of the signature practices of professional education are designed to help individuals develop their capacities for effective judgment in contexts where the right course of action is uncertain. They do this by making the learner's thinking and assumptions public in the presence of knowledgeable mentors and peers and by subjecting these to intense discussion and challenge. This ought to become standard practice in all fields of study.

What follows from the efforts to create open-ended and collaborative opportunities of such reform proposals is that, according to Elizabeth Coleman (2007), "it is likely that the traditional format of the fourteen-week class can no longer serve as the default option. Instead of the grid with its blocks of times and spaces, imagine something more akin to a medieval fair—lots going on, in a variety of formats, and all of it tempting."

The intellectual fusion of theory and practice is not limited to teaching. In terms of research, universities should experiment with the emergent paradigm of the so-called "transdisciplinary research," which "conceives and organizes research as a common learning process involving both society and science, a process that proceeds reflexively" (Thomas 2008). The idea is for scholars to learn from the input given by experts in the field to formulate scientifically valid questions about the intractable challenges posed by our messy world.

Prepare Students for the Complexity and Messiness of the World

Students today confront many uncertainties: be it uncertainties about knowledge, about the job market, about their lifestyle or their ability to plan the future. Yet, as Sheila Jasanoff (2007) points out, modernity has brought with it a belief in certainty as an attainable state. Perhaps it was the spread of binary thinking “that frames the future in terms of determinate choices between knowable options,” which made us see a dichotomy of “winning and losing” as “the only options.” In reality, we know how complex our problems are and that in most cases science can only supply us with partial solutions. In view of this knowledge, we would like to point out the paradox that while our thinking is more and more analogue, our technological advances are more and more digital. Therefore the task of the university has to be “capacity-building in the face of uncertainty ... a multidisciplinary exercise, engaging history, moral philosophy, political theory and social studies of science, in addition to the sciences themselves.” Jasanoff calls this disciplined method for teaching this way a “technology of humility.”

What is then the desirable relationship between the sheltered life of students in academe and the real world? Claus Offe (2008) recalls that in the past “education theorists used to believe that a wholesome distance from the banal realities of the world is nurtured by the teaching of what used to be canonized as classical.” Today we do not hold this belief. While introducing the “banalities” of the real world into academic studies today is more likely to be seen as desirable, it is usually seen from the vantage point of employability, i.e., usefulness to society. What Offe does not say, and this is one of the major claims of our book, is that the proximity of academic studies to real-life situations is an epistemological necessity; it is the way to understand the messiness and complexity of the world, and the necessary tool to develop the type of reflective thinking that we would like to foster. Yet this is what we understand to be one of the primary objectives of higher education. It is by facing such epistemological challenges that we can foster the ability in students to ask for well-informed reasons or to pass judgments based on knowledge. This we believe is essential to a well-functioning democracy.

Moreover, introducing students to non-linear problems is also a prerequisite for making them aware of the ephemeral nature of the “status quo.” It is by understanding nonlinearity that students gain an awareness of the fact that our collective fortunes are subject to sudden changes. It is by comprehending the true extent of transnational interdependence that, as Martin Luther King (1963) described it in his 1963 famous “I have a dream speech,” they become aware of the fact that “their destiny is tied up with our destiny.” If by engaging with society’s most persistent problems that they—even if they themselves may be healthy and well fed—come to see that, as John F. Kennedy said in his inaugural address as President of the United States (1961), the “enemies of man” are, indeed, our “common” concern.²⁴

Cultivate Self-understanding

It was perhaps Descartes’ greatest error to try to eliminate traditions, cultures, in fact all emotional elements from rational discourse. Academia’s abhorrence of non-rational phenomena clearly is even more of a hindrance when the objective is self-understanding. The pious hope of rational-choice apologists in the social sciences, who argue that all irrationalities balance out “on aggregate,” clearly is not helpful when we seek to get to bottom of what drives us as human beings. This problem was described adroitly in the *New York Times* by David Brooks (2011) entitled “The New Humanism,” in which he speaks of a “distortion in our culture. We emphasize things that are rational and conscious and are inarticulate about the processes down below.”

In recent decades, some traditional components in the canon of general education have been forgotten. It could be helpful here to reconsider them. Larry D. Shinn (2004), former President of Berea College, notes: “We would be wise to consider what we lost when twentieth-century liberal arts colleges chose reason over faith (instead of both) in their choice of text and method.” We claim that it is not belief but an early engagement with the world’s true complexity that could offer an important contribution to self-awareness. The crucial message here is that active involvement with facts and rationality is never enough.

²⁴ Kennedy in his Inaugural Address listed “tyranny, poverty, disease, and war itself” as the “common enemies of man.”

When it comes to self-knowledge all of these approaches can make fruitful contributions. Discussing complex biographies (e.g., Hemingway's, who survived three plane crashes and ended up committing suicide) or classical moral dilemmas ("Would you sacrifice yourself for the common good?") or comparative mythology are possible avenues to pursue. Regardless of the approach, educators should try to make explicit how the material they teach in class is relevant to students' own lives especially as it relates to the question: "How to live?"²⁵ What matters is that students become accustomed to not just using their capacity for critical thinking when examining phenomena beyond themselves. In short: Higher education should make a conscious effort to cultivate self-reflexivity, as it "is the essence of any kind of freedom that is possible for human beings" (Cook 2004).

Establish a New Culture of Collective Networked Learning

In view of technological changes, it is clear that the world has "suddenly, irrevocably, cataclysmically, epistemically changed—and changed precisely in the area of learning" (Davidson and Goldberg 2009, 19). Universities today must address this new reality. Today a participatory and networked culture of learning has emerged, "stressing cooperation, interactivity, mutuality, and social engagement for their own sakes and for the powerful productivity to which it more often than not leads" (Davidson and Goldberg 2009, 30). Contrasting the old and the new culture of learning, Davidson and Goldberg write: "Individualized learning tends overwhelmingly to be hierarchical: one learns from the teacher or expert, on the basis overwhelmingly of copyright-protected publications bearing the current status of knowledge. Networked learning is at least peer-to-peer and more robustly many-to-many" (Davidson and Goldberg 2009, 31).

In this "New Culture of Learning," to borrow a phrase coined by the book of the same name by Douglas Thomas and John Seely Brown (Thomas and Brown 2011), so-called "learning ensembles" spontaneously emerge "in which the members both support and sustain, elicit from and expand on each

²⁵ Such questions could be for example: "What is the right career for me?" "What kind of work-life balance do I want?" "Should one have children?" For a very readable introduction to Montaigne's œuvre that is mostly concerned with such practical questions see: Bakewell (2010).

other's learning inputs, contributions, and products" (Davidson and Goldberg 2009, 32). It is the task of every individual educator as well as that of the institution as such to reshape institutional learning in a way that not only allows for, but promotes as well, such ad-hoc coalitions characterized by flexibility, interactivity, and outcome-orientation. This challenges one of the basic pillars of our educational system, namely "the assumption that teaching is necessary for learning to occur" (Thomas and Brown 2011, 34). Instead of teaching students about the world, "the new culture of learning focuses on learning through engagement within the world" (Thomas and Brown 2011, 38).

Learning from Life about Life and for Life

In a comprehensive review of the articles published in the American Association for Higher Education's *Change Magazine* and AAC&U's *Liberal Education*, George Allan (2005) concludes that academics contributing to the debate on reforming higher education are not only in striking agreement on what is wrong with higher education, but also on what is to be done about it: "Today the emphasis is on life beyond the walls of academe, acquiring the skills by which to navigate effectively in a complex world and to do so in a principled manner, for the sake of humane values that regard all human beings as equally precious and the development of their varied potentials for personal and communal fulfilment as the primary aim of a liberal arts education."

The "Republican" ideal of educating "concerned citizens" is not equivalent to a total disregard for considerations of employability or social usefulness. In fact, we believe that working on the world's most intractable problems will prove to be a challenging enough training ground for any student to acquire the various skills required by the labor market. From rhetoric, presentation and soft skills to the most abstract and complex forms of mathematical modeling the whole arsenal of human capability will have to be employed in order to comprehend issues such as climate change, poverty and war itself. This would require a change in the aims of universities to make our future lives in all its dimensions the centerpiece of teaching, learning, research, and service.

CHAPTER IV

A MANIFESTO FOR CURRICULUM REFORM

Higher Education is ever more important to increasing numbers of people. And yet, in spite of all this growth and debate, there is very little talk about the curriculum. What students should be experiencing is barely a topic of debate. What the building blocks of their courses might be and how they should be put together are even more absent from the general discussion. The very idea of the curriculum is pretty much missing altogether.
(Barnett and Coate 2005, 1)

Although higher education is almost inconceivable without curricula, very little has been written about curricular formation and change.
(Slaughter 2002, 260)

Across all the discussion of access, affordability, and even accountability, there has been a near-total public and policy silence about what contemporary college graduates need to know and be able to do.
(Association of American Colleges and Universities 2007, “executive highlights”)

The quotations above, taken from American publications, show just how neglected curriculum research is, even in the United States where higher education studies are an otherwise well-developed scholarly discipline. In most of Continental Europe (with the notable exceptions of the Netherlands and the Scandinavian countries and a small but growing group studying the Bologna Process) and much of the rest of the world (e.g., Israel, India, China) Higher Education Studies barely exists as a scholarly discipline. Departments of education are primarily focused on didactics, and there are at best a few

dedicated individual scholars who are studying what institutions of higher education do on a qualitative level. One of the reasons for the reluctance of researchers to spend time on curriculum research is no doubt that, from the point of view of their careers, it is often considered a waste of time. Writing in the *Chronicle of Higher Education*, Michael Ruse (2011) concludes: “I cannot think of a quicker way to dismissal than for a young untenured professor at a major research university to tell the chair that he or she was going to spend the summer on curriculum issues.”

Yet, curriculum-crafting in itself is, or ought to be, a very important area of experimental and academic research.

Students in many countries are required to choose their course of study immediately upon entering a university. Here curricula are often purely discipline-based and do not seek to achieve an educational outcome beyond imparting the knowledge and skills necessary to conduct research or work in a related field. The educational experience of undergraduate students is thus very uniform and at the same time highly fragmented, as the educational experience of a student in particular course of study will bear little resemblance to that of another in a different discipline. While diversity is in itself positive, we believe, as we make clear in Chapter 3, that higher learning in all fields should aspire to an educational objective beyond teaching specific competencies in a given field.

Global uniformity of discipline-specific curricula is another concern. Curricula must be sensitive to national, social, religious and institutional differences. Taking a historical perspective in teaching—e.g., Newton coming up with the two body problem abstraction in response to the religious wars of his time—will teach students that the body of knowledge they learn about has not fallen from the heavens, but is the result of specific local circumstances. This kind of teaching does not alter the theories or the natural laws themselves, but rather changes the student’s perception of these “truths.” All laws are approximations, and the degree of approximation that is acceptable is ultimately contextual. Learning in this way will make it easier for students to remain flexible and adapt their own ideas of knowledge to local situations and circumstances. At the same time we are aware of the fact that general principles and guidelines must be developed that are true for all curricula, independent of contextual and local differences.

Preparing such guidelines will be a project involving the work of many scholars over a long period of time. Such a project will include experi-

mentation, and principles deemed universally valid will have to be discussed on a global level. Moreover, it is also very important that when coming to contextualizing these principles for specific curricula, students should be full partners. Once the principles are more or less agreed upon, specific curricula will have to be worked out that translate the principles into actual curricula. This has to be done by a critical mass of scholars, who will then also be prepared to teach those courses and experiment with them. Once a specific curriculum has been articulated, it is extremely important that the considerations involved in this process are explicitly formulated and published as well as staunchly defended against critical voices.

This goes way beyond supporting a set of ideas in principle. It requires a great sacrifice: professors will have to actually teach what they agreed should be taught! In other words, they will have to give up their cherished privilege, which is often confused with academic freedom, that each professor can teach whatever he or she fancies. We believe that academic freedom is not necessarily the freedom of individual professors to do as they please, but rather the freedom of the faculty to collectively make binding decision on what should be done. This does not of course exclude the possibility of faculty members offering to teach specific courses beyond what is required by the curriculum. But such offerings should be understood as additions to a well thought-out curriculum, particularly when we understand that a curriculum is not a rigid canon but rather an agreement of clearly formulated teaching objectives, with learning outcomes the salient point—that is, output rather than input.

In July 2010, the German Wissenschaftsrat (the WR or “Scientific Council” advising German state governments on higher education policy) published its recommendations on the role of the Fachhochschulen (technical colleges) and in principle accepted the idea that undergraduate education at these institutions should be primarily concerned with preparing students for the workforce (Wissenschaftsrat 2010). This is not surprising, since preparation for employability has become a centerpiece of higher education policy and the German Fachhochschulen are apparently much better prepared for this task than the universities. However, the formal distinction between the Fachhochschulen and the universities is in the process of eroding, partly as a result of efforts between the two to engage in greater cooperation. These include greater flexibility in admitting students with a Bachelor’s degree from a Fachhochschule into a Master’s program at a university, and even calls for joint doctoral programs between Fachhochschulen and universities. Such

trends, also apparent in other countries, suggest that the possibility for more sweeping reconsiderations of the curriculum—what students learn and faculty should teach—is growing. Institutions may still prefer to follow different approaches, but such cooperation could unite them in the objective to educate concerned citizens.

The Core Ideas behind Comprehensive Curriculum Reform

At the end of the first decade of the 21st century, a group of scholars met at the Wissenschaftskolleg zu Berlin in order to discuss principles for university curricular reform, that could serve as guidelines for the university of the 21st century. The resulting Curriculum Reform Manifesto²⁶, co-authored by Yehudi Elkana, included eleven important key principles to rethink undergraduate curricula for our times. We list them as follows:

- 1) As a central guideline teach disciplines rigorously in introductory courses together with a set of parallel seminars devoted to complex real life problems that transcend disciplinary boundaries.
- 2) Teach knowledge in its social, cultural and political contexts. Teach not just the factual subject matter, but highlight the challenges, open questions and uncertainties of each discipline.
- 3) Create awareness of the great problems humanity is facing (hunger, poverty, public health, sustainability, climate change, water resources, security, etc.) and show that no single discipline can adequately address any of them.
- 4) Use these challenges to demonstrate and rigorously practice inter-disciplinarity, avoiding the dangers of interdisciplinary dilettantism.
- 5) Treat knowledge historically and examine critically how it is generated, acquired, and used. Emphasize that different cultures have their own traditions and different ways of knowing. Do not treat knowledge as static and embedded in a fixed canon.
- 6) Provide all students with a fundamental understanding of the basics of the natural and the social sciences, as well as the humanities. Emphasize and illustrate the connections between these traditions of knowledge.

²⁶ <http://www.edition-open-access.de/studies/1/29/index.html>

- 7) Engage with the world's complexity and messiness. This applies to the sciences as much as to the social, political and cultural dimensions of the world. Such an engagement will contribute to the education of concerned citizens.
- 8) Emphasize a broad and inclusive evolutionary mode of thinking in all areas of the curriculum.
- 9) Familiarize students with non-linear phenomena in all areas of knowledge.
- 10) Fuse theory and analytic rigor with practice and the application of knowledge to real-world problems.
- 11) Rethink the implications of modern communication and information technologies for education and the architecture of the university.

A central demand of the Manifesto is the call for teaching both discipline-specific introductory courses and interdisciplinary seminars covering the complex real-world problems. And, to the extent possible, ways be found to synthesize the disciplinary knowledge and understanding the complex world we live in, in effect developing the capacity to engage in interdisciplinary dialogue and practical solutions.

After hundreds of years of experimentation with curricula at universities all over the world, one firm conclusion emerges: we must teach basic disciplines in a systematic, rigorous and methodologically diverse way. This approach is important and independent of whatever the disciplines happen to be in a given period. This remains true in spite of the fact that disciplines change, new ones emerge and old ones die out.

The seemingly obvious and false idea of completely replacing the teaching of disciplines in favor of problem-oriented teaching—something that recurs in various forms time and again—always leads to the same unsatisfactory result: namely, to a superficial attempt to avoid the hard work of mastering the foundations of the disciplines.

New disciplines emerge over time, reflecting current intellectual movements or preoccupations. In the beginning, they usually reflect real-life problems. However, once a discipline is established, it has a tendency to become pre-occupied with itself. The very term “discipline” indicates that it is not primarily concerned with the free, unencumbered and open exchange of ideas. Solutions to real-life problems typically lie beyond the reach of any one discipline and usually require the insights generated by a number of different disciplines.

Therefore disciplines have to be taught rigorously, while exposing at the same time their intellectual limits or limitations. Or, differently put: we have to teach disciplines in such a way that we prepare students for interdisciplinary situations. Whether or not experts will find it easy to work in interdisciplinary teams often depends primarily on their undergraduate training. If their education was oriented in the direction of marinating the student in interdisciplinary thinking, later, in real-life work-situations, they will have little difficulty when it comes to cross-disciplinary collaboration.

Introductory courses in the various disciplines tend to emphasize theory over practice and to teach rigorously discipline-specific method(s) tuned to the theory being taught. But teaching theory without discipline-specific practice is an arid exercise. Not only does it eliminate any discussion of real-life problems, but it also ignores the fact that no discipline relies on one all-purpose method.

Disciplines have to be taught in such a way that the persons being taught are exposed to many possible methods, and that they develop an ability to select the method appropriate to a specific problem. This is one essential meaning of the often-quoted saying that more important than to teach facts, is to teach how to learn.

In summary, we must teach disciplines in such a way that the learning outcome for the students includes being “marinated” in interdisciplinary problems, being aware of the practical alongside the theoretical, being aware of many methods and of the need to tune the method to the problem, and being aware of the fact that any and all disciplines have their limits. To do this knowledge must be taught within its social, cultural, and political contexts. Instructors should not simply teach factual subject matter, but highlight the challenges, open questions and uncertainties of each discipline. To do this, the current separation between theory and practice in most universities, technical and vocational institutions must be abolished.

The Theoretical Basis of the Curriculum Reform Manifesto

It is useful to recall here the distinction established a few decades ago between the “body of knowledge” and “images of knowledge.” “Images of knowledge are socially determined views on knowledge (as against views on nature or society... i.e., body of knowledge). Images of knowledge describe a) the

sources of knowledge; b) legitimization of knowledge; c) audience or public of knowledge; d) location on the sacred-secular continuum; e) location of some of the aspects on a time-scale continuum; f) degree of consciousness; g) relatedness to prevailing norms, values, ideologies; h) translatability into statements about nature..." (Elkana 1981).

Images of knowledge are an integral part of a discipline and should be studied together with the body of knowledge from any given discipline. It is important to distinguish clearly between contextualization and relativization. Seeing ideas in context does not mean that the body of knowledge changes—or that “anything goes”—but it does mean that interpretations of experimental or theoretical results, decisions on the importance of problems, the relevance of the research-results, all depend on images of knowledge. It is one of the most important insights about images of knowledge that they are never final, certain or total. It should be kept in mind that the questions and uncertainties of a discipline are changing continuously due to the changing images of knowledge. The tendency to teach disciplines as if they were a set of eternal truths is one of the most detrimental aspects of much of university teaching.

The essential fluidity of the disciplines makes it critical to familiarize students with non-linear phenomena in all areas of knowledge, as most phenomena we encounter are of a non-linear type. These cannot be described by straight causal relations, are not strictly predictable and cannot be expressed mathematically in simple differential equations. In linear systems the whole is precisely equal to the sum of its parts. When the whole amounts to much more than the sum of its parts, the mathematical expression of this state is in non-linear equations (one whose graph is not a straight line but a kind of curve).

Yet, in our conventional curricula, in the natural as much as in the social sciences, we typically teach undergraduates only linear thinking, claiming that all other phenomena are so complex that they only will master the tools to deal with them in their graduate studies.

The significance of avoiding non-linear problems is obvious. Let us take one all-important example: Most experts agree that there is such a phenomenon as man-made “global warming.” Where all the experts disagree—as well as the politicians—is what form it will take and at what point it will become unmanageable. In order to predict one would have to consider all the relevant parameters and use them in one model. Because of the enormous

number of parameters, this is clearly an impossible task. What scientists do instead is to select a part of the relevant parameters, and then construct a model which predicts a possible outcome. Every different selection of parameters, that is, every different model, gives a different prediction. This is a typical case of a non-linear phenomenon. There is a widespread tendency to ascribe all this uncertainty to vested interests, lobbying and various other forms of corruption. Rarely do scientists or for that matter politicians admit that science simply does not have definitive answers for many questions and that we are forced to do or act by way of what appears plausible even if we do not have the proof in a mathematical sense for our position.

Our task is to see to it that students, the citizens of tomorrow, have a basic understanding not only of the cumbersome process of governance in a democratic society but also a cognitive awareness to judge or interpret information, arguments and claims. A fundamental understanding of non-linear phenomena is a critical part of being a citizen who can make clear-headed decisions when it comes to choosing between alternatives from consumer goods to voting in democratic elections.

How to teach non-linear thinking to all students is a complex issue. Some suggest presenting theories such as chaos theory or complexity theory early on. While there is disagreement about how scientific these theories are, there are also a number of excellent books in popular science literature that deal with these topics, books that could be used in introductory undergraduate courses as the basis for small group discussions among students and faculty, or as material for independent study.²⁷

To take this a step further, in small-group discussions of real-life phenomena, which should accompany the rigorous introductory courses, first-year students should learn to work with and practice non-linear thinking. As topics for such early discussions one could take any number of problems: societal issues concerning limited water resources, energy, security, or disorders in the composition of the atmosphere, air or water turbulence, fluctuations in populations, oscillations in the brain or in the heart, psychological afflictions, political revolutions, non-equilibrium states of the economy, or the diverse cases of “emergence.”

²⁷ To illustrate our point we would like to refer to the following books on the topic: Gleick (1988), Waldrop (1993), Barabasi (2003), Lorenz (1995), Ball (2005), Gladwell (2002), Mitchell (2009).

The concept of “emergence” might warrant some explanation. Much of classical science was built on the presupposition that systems can be understood in terms of their constituent parts; systems could be broken down to those ingredients and could be built up again from them. The idea was that the whole could be built up from the parts, and that the whole was neither more nor less than the sum of those parts. In the natural sciences this meant analyzing all kinds of bodies down to atoms, nuclei, electrons, and, in later developments, quarks; living systems were reduced to explanation in terms of cells, molecules, and their constituent parts. In fact we learned in due course that very often the whole cannot be reconstituted from its parts—the whole exhibited new, “emergent” qualities. The whole is more than the sum of its parts.

The classical certainty that all phenomena are expressible in mathematical terms, which in turn can be reduced to more basic formulae, until finally—in Steven Weinberg’s words (1992)—a theory emerges, is not universally true. Rather, we have to renew our search according to Phillip Anderson’s approach (1972), which posits that perhaps every level of organization has its own fundamental laws, which are neither reducible nor exchangeable.

For example: General Relativity Theory applies to the very big (beyond human scale or experience), like galaxies and universes; Quantum Mechanics applies to the very small (way below the human scale) like subatomic particles. Chaos Theory, or Complexity Theory, deals with objects on the human scale—what we call “real life.”

Similarly, classical economic theory—mathematically sophisticated as it may be—is based on the assumption that human beings are rational and that the markets strive toward perfect equilibrium. The on-going financial crisis has shown us once again that these assumptions are anything but trivial and that there are so many “intervening” elements that lead in multiple other directions than equilibrium.

According to our understanding of an undergraduate curriculum, it is imperative that this kind of complex subject matter be taught. And to give it greater impact, it would be intimately connected to the great problems humanity is facing: hunger, poverty, public health, sustainability, climate change, water resources, security, etc.

A New, Comprehensive Understanding of General Academic Education

An understanding of these phenomena must be considered just as important as quantitative abilities and must be part of a new understanding of general education in 21st-century higher education. This is a noble objective, and we are aware of the fact that these kinds of demands seem like wild dreams in a society in which ca. 20% of the population have difficulties with basic reading and writing. Also, we should point out that we are not advocating that everyone should strive to become an academic. It is not necessary that all students penetrate the deepest core of the challenges humanity is facing or that they come up with their own solutions. We do believe, however, that confronting them with these issues will help to shape a new form of consciousness. It is important to make students aware of these problems so that they may form their own informed opinions on them.

Many at this point might raise doubts about leaving students partially informed, never in the position to fully grasp the highly complex problems we would like them to engage. As both pragmatists and believers in democracy, we would like to point out, however, that there is no such thing as a non-decision. Whether it be political choices in elections, media consumption or consumer decisions, students will take a stance on a daily basis. Hence we believe that students should confront these issues, for if they do not, then this also is an expression of societal priorities that sends a signal we do not deem acceptable. Students who, parallel to their chosen course of study, take seminars on real-life problems are more prepared on average to make better (also in a moral sense) decisions than if they never confront these problems, problems which basically concern all humanity. These seminars may not put students in the position of solving these problems, but they may help them to find the courage and the will to act or demand action, prerequisites without which even the most knowledgeable experts will not be able to solve complex global problems.

In this context we should remember that Martin Luther's call in the 16th century for universal schooling was met with general rejection as something absurd that could not to be taken seriously. There were many who thought that providing education to the masses was neither necessary nor desirable. The fact that this point of view seems rather curious today gives us the courage to believe that the conception of higher education as general education we outline will one day become a reality.

How the New Enlightenment Will be Incorporated in the Curricula

A comprehensive undergraduate curriculum that follows the leading principles described above, teaching a historical-evolutionary understanding of knowledge and including an engagement with real world problems and non-linear phenomena, will be hard to achieve and indeed, we cannot be certain what exactly it would look like. But select examples express how these ideas could find a place in the teaching of disciplines.

Newtonian determinism seemingly works quite well for huge, distant, celestial objects. The closer we get to our daily experiences in life, the less deterministic our forecasting becomes; for stars and comets it works; for clouds and winds it does not. Aberrations occur regularly, unexplained findings are phenomena of every study, unforeseen consequences emerge with every decision (Anderson 1972; Gaelic 1988; Kauffmann 2008).

Philip Anderson's (1972) classic paper represents probably one of the strongest statements against reductionism, could serve as an important point of departure for future discussion. He challenged the central premise of reductionism that in the final account all physical laws can be reduced to one basic law. Raising the question: "How do we know that not all different levels of organization have different fundamental laws, not reducible to each other?" opened up totally new approaches for studying nature and life.

In the natural sciences and in engineering, students learn to solve differential equations, which represent reality as a continuum that changes smoothly from place to place and time to time. Students are rarely confronted with the fact that in reality most differential equations cannot be solved.

In physics, the phenomenon of turbulence and phase transitions (liquid to gas; non-magnetized to magnetized) are good illustrations of the ideas expressed above. Both should be explained conceptually with as little mathematics as possible early on. The same goes for attractors. Oscillators are usually introduced, but not non-linear oscillators.

First-year students should be taught to deal with non-linear equations on the basis of examples as close to real-life as possible. Students should also be taught the different definitions of complexity and self-organizations as they occur in the various disciplines, with explanations given as to the reasons why different disciplines use different definitions.

In the social sciences, the entire spectrum of possibilities regarding narratives from classical vs. new economics, for example, offer further illustrations. Sampling the works of Adam Smith, John Maynard Keynes, Joseph Schumpeter, Brian Arthur, Joseph Stiglitz, Amartya Sen, Herbert Simon, and Edmund Phelps will help students appreciate the many different perspectives on offer in the marketplace of ideas. Basic dogmas such as the stability of the marketplace and the assumption that markets always tend towards some equilibrium should be discussed in light of their apparent failure.

Moreover, students should be confronted with the questions concerning networks: how do networks emerge, what do they look like and how do they evolve. Students need to realize that networks are present everywhere: in nature, in society as well as in business and intellectual history. Undergraduate teaching should address questions such as: How do networks come about, what are they composed of, and how do they develop further?

In sociology, students could be introduced to Mark Granovetter's (1973) classic paper: "The Strength of Weak Ties" to introduce the idea that society is structured into highly connected clusters—far from a random universe. Self-organization and nature's urge to synchronize can be explained here with numerous examples. The "bell-shaped curve" (Gaussian distribution), the "power law," the "scale" and "scale-free" distributions could also be introduced and explained.

A broad and inclusive evolutionary mode of thinking should be imparted in all areas of the curriculum. It is our firm belief that evolution in its four dimensions—Genetic, Epigenetic, Behavioral, and Symbolic—has actually, by way of tacit knowledge, become an integral part of our thinking in all areas. The importance of the evolutionary mode of thinking has become evident in the last few decades formally as well as informally. Formal examples for the emergence of the evolutionary perspective are new areas of scholarship like evolutionary economics, evolutionary psychology, evolutionary immunology or evolutionary medicine.²⁸

Informally, however, without it being evident from the labels, the idea of time-dependence of theories, concepts and interpretations of experimental results has become commonplace across all fields of learning. Thus it seems

²⁸ The fact that most medical faculties still do not teach evolutionary theory in a comprehensive way is in itself striking.

very important to us that an evolutionary approach now should become an integral part of the curriculum not just in the natural and social sciences, but also in the humanities. Possibly a somewhat different form has to be found for biology students, for science students who do not study biology, for students of the social sciences, for students in the humanities, for medical students and for students in the non-medical professions. Yet, some form of introductory course on “Evolution in Four Dimensions” should become part of every curriculum (Jablonka and Lamb 2005). Teaching evolution in tandem with a seminar on non-linear thinking will also raise issues of complexity. It should thus be emphasized that an increase in complexity in the course of evolution is neither inevitable nor universal (Novotny 2001; Smith and Szathmary 2001).

Clearly these are a collection of points, neither systematic nor complete, serving simply to illustrate non-linear thinking. Obviously the list could be constructed differently, but what is critical is the fact that students should come away with a degree of skepticism when confronted with scientific dogma.

We would need the expertise of the best scholars working in these areas to tell us how to make them into a coherent whole. The important point is to realize that the mode of thinking that is to be fostered by these courses is a fundamental ingredient of any person’s intellectual repertoire if he or she is to gain an understanding of our “complex and messy” world.

The greatest obstacle to adopting the approach advocated here arguably is the worry of many scholars that introducing all these advanced concepts and theories on a superficial level will result in cultivating half-baked ideas. The answer to this is that if such “courses” are offered parallel to the rigorous, technically sophisticated introductory courses, an adequate balance will be created between scholarly rigor and the need to address relevant and urgent challenges similar to what we find in the popular scientific literature.

An added advantage of studying real-life situations is that it satisfies the curiosity with which most students enter university. This is important not only because it will prevent students from dropping out, frustrated by irrelevance and boredom. It should also be noted that most students today leave university with the reductionist intellectual framework introduced at the BA level, often assuming that this disciplinary framework supplies the tools needed to comprehend the world. In this case, university studies resemble indoctrination in a particular discipline rather than an education

in free thought. One advantage of the reform we propose is that students from varying academic areas—be it in the humanities, natural sciences or social sciences—would be better able to communicate with each other and learn from one another, making it easier later in life to understand the work of others, or at least respecting it. In short: that they develop the capacity for interdisciplinary dialogue.

Knowledge must be historically and critically examined in how it is generated, acquired and used. Instructors must emphasize that different cultures have their own traditions and different ways of interpreting knowledge. Knowledge cannot be treated as static and embedded in a fixed canon. This principle can easily be understood as the demand for course offerings in philosophy of science and/or in the comparative study of cultures. Obviously it would be ideal to be able to assign some background reading that situates what is being taught in courses in the sciences or in the social sciences.²⁹ The cultural differences between schools of thought in the social sciences or the humanities, and naturally also in the interpretation of results in the natural sciences between the United States or Europe and China or India³⁰ are well documented. These differences should be openly thematized in the disciplinary courses.

All students should be provided with a fundamental understanding of the basics of the natural and the social sciences and the humanities. Instructors should emphasize and illustrate the connections between these traditions of knowledge.

A curriculum, which aims to give a comprehensive general education to all students, irrespective of what career path they later choose, must cover what the American Association of Colleges and Universities' LEAP Report (2007) calls basic "Knowledge of Human Cultures and the Physical and Natural World." Our understanding of a comprehensive general education

²⁹ We mention here a few important works, chosen to illustrate how knowledge is created in historical terms: Fleck (1979), Polanyi (2009), Dear (2006), Hirschman (1977), Bruner (2003), Kapuscinski (2008), Renfrew (2007), Lloyd (2007).

³⁰ The extent to which all knowledge is to some degree local, even in the midst of our quasi-universal scientific culture, is evident in the fact that papers signed by hundreds of authors describing an experiment in high energy physics can be immediately ascribed to the laboratory in which the experiment was conducted. The local language of the Stanford Accelerator, of the Fermi Lab, of CERN, of Brookhaven is recognizable, although the topic of several papers, originating at any one of these institutions may be almost identical.

approach could also be formulated in terms of an acquisition of diverse literacies. We are not describing a general recipe, but rather a broad spectrum of economic, statistical, social, technological, cultural, natural scientific, medical, and political knowledge, which we believe should be questioned in every new context.

The implications of modern communication and information technologies require us to rethink the very architecture of the university. New technologies emphasize the distinction between “information” and “knowledge”; with the former being increasingly available everywhere, at any time and for anyone, making the frontal lectures at the university largely superfluous. The valuable time of professors will be much better spent in small discussion-based seminars, where students will teach and be taught how to critically digest and organize information into knowledge. The architecture of the university of the future must reflect this change: lecture halls will only be required for major events. Instead, smaller rooms suitable for group work and faculty or peer-to-peer mentoring, discussion and deliberation will be required (Thomas and Brown 2011).³¹

These are all rough guidelines that could easily be formulated differently. There are thousands of ways of incorporating or translating them into functioning curricula. Working with the question of how these curricula should look will be of critical significance for the future of universities in the 21st century. The basic message is that without taking on the question of curriculum to address the challenges and expectations of society, as well as the identities of the students, we will greatly diminish the value of universities.

The History of Debate on Curriculum Reform

Unfortunately, the study of curriculum creation is not a well-researched topic. From among the immense literature on higher education in general, very little relates to the problems of curriculum-creation in today’s globalized world. Yet, there are a few relevant books that should be mentioned. One of these, by W. B. Carnochan (1993), is written from the point of view of a

³¹ Thomas and Brown (2011) do not, however, answer the question of how basic theoretical knowledge, or the systematic acquisition of information, which we believe must be given in rigorous introductory courses, can also be imparted in this more autonomous, sometimes playful mode.

genuine humanist. Carnochan is a Professor of the Humanities, and was for six years the Director of the Stanford Humanities Center.

The overall importance of this book lies in the realization that continuing the discussion on what curricula best serve the purposes and objectives of higher education, should be one of the central tasks of the university. The intellectual crisis of the university today—not only of liberal education (unless teaching the sciences, technology and the professions is all subsumed under liberal education)—is precisely the neglect, if not total elimination, of this discussion from the university discourse on all levels: trustees, presidents, administrators and above all faculty do not raise the question of what should be taught and why or when they do, it usually amounts to horse-trading to see which department gets to offer more or less courses.

England and the United States, from the mid-19th and through the last third of the 20th century, were indeed the battleground for conflicts and debates concerning curricula. Today the real problem is that this battleground deteriorated to repetitive staleness, and society, both on the political level and within the universities themselves, chose to stop discussing priorities, aims and thus the content of curricula beyond the mantra of “employability.” It is Carnochan’s thesis that now, more than ever, a historical and conceptual analysis is needed in order to gain a clearer sense of purpose and also to find answers to the questions brought up by local needs—be they social, political, economic, spiritual or simply flowing from the discipline.

Our present-day curricula represent the values of the Enlightenment, with the emphasis on such principles as linearity, universality, context-independence and others recited. Especially, and most harmfully, they are built on the idea that young people need certainty, even at the high price of essentially misleading them with what is being taught. This seems to us the wrong presupposition: young people, like all people, need emotional certainty, but not cognitive certainty. We can allow them the chance of confronting the fact that academic or scientific knowledge cannot solve all problems and that there is no agreement on the answers to many questions.

For a long time universities have considered the social, religious and cultural contexts in which they are embedded to be irrelevant. The curricula of the leading research universities, including all of their shortcomings, have by now become globalized (Deem, Mok, and Luca 2008). Curricula in European universities tend to be quite similar as they operate in very structured, egalitarian systems. While it was probably only intended to be

an egalitarianism of funding, access and quality, it happened to also result in a very homogenous landscape as far as curricula are concerned. In the United States, with its complex ecosystem as far as funding and quality are concerned, curricula interestingly show the greatest diversity.

Thus it is not surprising that, at the very moment Europe is leaving its egalitarian past behind and is slowly and carefully beginning to differentiate, curricular innovations begin to emerge. So far, the efforts aimed at raising quality have mostly focused on the research function of the university (e.g., in Germany and France) and have not yet touched the curricula.

Recently, however, a new wave of innovative thinking about curricula is sweeping the globe. Or as Hannah Fearn (2009) described it, in an article portraying various institutions that are in the process of introducing new curricula: “Worldwide, it appears that there is a genuine demand for a university education that does not focus solely on academic prowess.”

The emergence of liberal arts colleges in Europe in the last fifteen years or so is particularly notable (van der Wende 2011). This development not only has given rise to liberal arts colleges, such as the University Colleges in Utrecht and Maastricht as well as the Roosevelt Academy, that are modeled closely on US liberal arts and honors colleges.³² This international movement also inspired existing institutions to rethink their curricula and spawned a number of new institutions explicitly dedicated to exploring uncharted curricular territory. In the following we would like to briefly introduce a few of these institutions and point out some of their distinctive features. None of them is doing or have done everything we suggest. But all of them do something worthy of attention. A great deal more would have to be said to do justice to these institutions. We will concentrate here on those aspects of their curricula that mirror the principles outlined above.

New Approaches for a Comprehensive General Education

In the German context it is worth noting two introductory and interdisciplinary pre-collegiate studies programs. The first, Leibniz Kolleg, is the most traditional example of a general education curriculum in Germany. The

³² While independent liberal arts colleges have existed in the US for centuries, in the late 1970s a trend started to create liberal arts type “honors colleges” that are embedded within or affiliated with a larger university. Currently 70 such colleges exist (Schmidt 2010).

objective here is to offer students the opportunity to acquire a broad overview (“ein Blick über den Tellerrand”) and an understanding for the problems in other disciplines and thus a chance to learn and to perform academic work in an interdisciplinary fashion. The intention of giving students a broad intellectual spectrum, flexibility and a willingness to engage in dialogue (the latter being especially relevant!) is something we expressly welcome.³³

The second is the Studium Naturale at the Technische Universität München, which notably is supported by the Stiftung Mercator and the Volkswagen-Stiftung. It offers a “polyvalent” introductory natural science education at a college level, which ties the life sciences to the neighboring fields of mathematics, physics and chemistry. The program is an ideal example of interdisciplinary orientation, which is introduced from the outset of studies.³⁴ General education that goes beyond the requirement of taking a couple of courses offered by a different department in a continental European context is rare.

While the so-called Leuphana Semester, an interdisciplinary introductory semester, at Leuphana Universität Lüneburg may not appear to be revolutionary from an international perspective, it is a genuine novelty in a German context. Declaring a major at the time of enrolment is a legal requirement, but first-semester students have to take courses in a whole range of disciplines. Moreover, they get to work together on civic projects in the local community. After the first semester they choose a major and a minor, getting into the groove of mostly disciplinary programs. What is special, however, is the so-called Komplementärstudium. This essentially is a requirement for all students to take at least one interdisciplinary seminar per semester from a special selection of courses. These courses are especially designed for the purpose of fostering interdisciplinary dialogue and are taken by students of all disciplinary backgrounds. While these seminars are not necessarily concerned with real-world problems, the model used here comes relatively close to what we are suggesting. Moreover, Leuphana’s Institut für Ethik und Transdisziplinäre Nachhaltigkeitsforschung, which seeks to combine theory, transdisciplinary research and practice (in the form of case studies) so as to grapple with questions of sustainability in

³³ See Leibniz Kolleg, <http://www.uni-tuebingen.de/leibniz-kolleg/studium.html>.

³⁴ See Technische Universität München, <http://studiumnaturale.wzw.tum.de/index.php?id=2>.

different fields, seems well placed to develop the kind of interdisciplinary real-world seminars we are calling for.

Following the Humboldtian Paradigm of *Einheit von Forschung und Lehre*, the Jacobs University Bremen aims to involve undergraduate students in research in search of solutions to global challenges from the undergraduate level on to find solutions for today's global challenges. Beyond this commitment to education through transdisciplinary teaching and research, it is the creation of several new study programs at Jacobs that is worthy of attention. For example, instead of launching an undergraduate program in Economics or Business Studies, Jacobs consulted academics and practitioners so as to come up with a Global Economics and Management program. This profoundly interdisciplinary program sets out to give students an idea of the "complex economic challenges" we are facing at the beginning of the 21st century. These challenges include global financial and economic crises, environmental devastation and catastrophes, poverty and inequality. The teaching occurs in different modules, which combine economics and management with a variety of disciplinary courses, e.g., history, political science, sociology, as well as communications science, engineering and the natural sciences. Much along the lines of the rationale behind our idea of a New Economics, the program explicitly acknowledges that this broad disciplinary approach is essential to understand core economic concepts, including efficiency, equity and human welfare: "All these disciplines have proven to be of crucial importance for the understanding of economic core concepts such as efficiency, equity, and human welfare." This decisive commitment to interdisciplinarity is similarly evident in other Jacobs programs such as Integrated Cultural Studies, which integrates literature and art, Integrated Social and Cognitive Psychology, which focuses both on cognitive processes and behaviors and on their interaction with the social and cultural context, and Integrated Social Sciences, which combines the disciplines of political science, mass communication, sociology, and economics. Also, the peer-to-peer teaching models in the area of biochemistry or the curriculum in the field of bioengineering appears to be initiatives that are breaking new ground.³⁵

The Zeppelin University, founded in 2003 pursues a new path best described in its own words: "Real Problems are Undisciplined. So are We!"

³⁵ See Jacobs University, <http://www.jacobs-university.de/study/undergraduate>.

Social phenomena seldom follow the patterns of academic disciplines. Thus, ZU is committed to a decided support of interdisciplinary research: Cross-faculty research associations and clusters, as well as research centers, work on central, socially relevant issues, research colloquia invite discourses across disciplines, and the annual research topic of the whole university joins scholars of different faculties in a many-voiced exchange.

ZU promotes interdisciplinary perspectives both in the area of teaching and on the level of the students, for example in the context of the so-called Zeppelin Year. Interdisciplinarity, in the sense of a challenging yet promising cooperation of different academic disciplines on one phenomenon, is an integral part of the research and teaching profile of the university.³⁶

Zeppelin's program is based on a line of innovative teaching concepts and the first-year concrete practice or research projects aim at fostering a similar perspective as the seminars handling real-life situations we propose.

As far as the concentration on values goes, we would like to mention two institutions that are experimenting with new value-based approaches to general education. The Berlin-based European College of Liberal Arts (now Bard College Berlin), a very small institution that was launched as a summer university in 2003, has developed a "value questions" approach to liberal education. The rationale for value-centric general education is described as follows: "The first premise of this approach is that questions about values have a pre-disciplinary claim on all of us ... Placing such questions at the centre of a university curriculum is unusual, but has many advantages. An ongoing concern with value questions results in academic training that is not merely academic, but relevant far beyond academia. A curriculum focused on value questions allows academics from many different backgrounds to work together with a shared sense of purpose." The claim that this allows for "better integrated liberal education than the distribution requirement model, and is more flexible than the great books program" seems plausible. The statement that a values approach to liberal education "invites dialogue between different cultural and political commitments, and reflection on the relation between theory and practice" is illustrative of the institution's commitment to global contextualism. Moreover, the idea of

³⁶ See Zeppelin University, <https://www.zeppelin-university.com/research-issues/profile-projects/index.php>.

taking value questions as the starting point of liberal education clearly resonates with the idea of educating concerned citizens.³⁷

Hong Kong University in many ways is a much more traditional university. Yet, it is undergoing fundamental reform, switching from a three year to a four year undergraduate model and implementing bold curricular reforms. “We’re trying to get away from the idea that there’s a body of essential knowledge,” says Gwyn Edwards, coordinator for the common-core curriculum and a former member of the education faculty. The goal is to use the common core “to engage students with questions about the human condition” (Hennock 2010). The university has come up with an official list of educational objectives. In pursuit of these objectives, students are required to take the Common Core Curriculum covering four distinct areas of inquiry (namely: Scientific & Technological Literacy, Humanities, Global Issues, China: Culture, State & Society). These areas of inquiry feature interdisciplinary courses such as “Feeding the World,” which explores global food security, water shortages, and bioengineered crops, or “Body, Beauty, and Fashion,” which combines psychology, media studies, and gender studies. We see great promise in the idea that a university negotiates and states explicitly its educational objectives so that these may become an issue of on-going debate. Moreover, relating real-world problems to the human condition is a laudable 21st-century approach to general education.³⁸

Next we would like to mention a few colleges and universities that, to different degrees, require all of their students to engage with global challenges.

The University College Amsterdam, something of a late bloomer amongst the Dutch university colleges, describes its approach to liberal education as focused “on far-reaching themes and real-world problems in science and society.” This translates into practice as a requirement for first-year students to take courses that focus on “The Big Questions.” These courses approach big questions in science as well as in society from different perspectives with the explicit objective “to stimulate debate from day one.” Addressing students directly, the institution’s webpage states: “You are encouraged to reflect on your own position with respect to these ‘big questions,’ and how you can personally engage with them.” Its interdisciplinary themes include: Health and Well-being; Energy, Climate and Sustainability; and Life, Evolution, and

³⁷ See European College of Liberal Arts Website, <http://www.ecla.de/academics/value-studies/>.

³⁸ See Hong Kong University, <http://www.hku.hk>.

the Universe. This is exactly what we think general education at the university level should be about.³⁹

Similarly, the University of Aberdeen's new, so-called Sixth Century Courses—a reference to the six centuries of the university's existence—are “designed to show how different disciplines work, to introduce and compare the fundamental perspectives of a number of disciplines and, normally, apply these to real world issues and problems.” The idea behind these courses is to broaden the students’ “perspective and produce better-informed discipline graduates with a wider and more critical understanding.” Yet, as is the case in Amsterdam, students are only required to take “one such course at some time during their degree program (“Enhancing Learning: the Aberdeen Approach,” 2008).

Leiden University College and Barrett Honors College are taking this idea a few steps further. Leiden requires that students take four courses under the category of “Global Challenges.” These include Peace & Justice, Sustainability, Prosperity, and Diversity. The goal is to educate students so that they can contribute to solving these challenges in the future. This approach may indeed come very close to what we are calling for throughout this book: real-world seminars that run parallel to disciplinary education.⁴⁰

Barrett, the Honors College of Arizona State University, reveals many of these same commitments. Calling itself “A Public College of Scholars,” Barrett “is a selective, residential college that recruits academically outstanding undergraduates across the nation.” The emphasis is on high academic achievement, a broad array of internship opportunities, and connections to leading practitioners. It takes general education seriously. The signature course for first year students is “The Human Event,” which occurs in small seminars and explores the “world’s great literature and humanity’s most-profound ideas.” Barrett has been named “Best Honors College” in the country.⁴¹

In 2001 the National Center for Science and Civic Engagement at Harrisburg University of Science and Technology initiated a program under the National Science Foundation’s CCLI national dissemination track entitled “Science Education for New Civic Engagements and Responsibilities” (SENCER). SENCER supports faculty, students and academic

³⁹ See University College Amsterdam, <http://www.auc.nl/acadprog>.

⁴⁰ See Leiden University, <http://www.universiteitleiden.nl>.

⁴¹ See Barrett College at Arizona State University, <http://barretthonors.asu.edu>.

leaders in their effort to improve undergraduate STEM (science, technology, engineering, and mathematics) education by connecting learning to critical civic questions. The program's one-sentence self-description reads: "SENCER applies the science of learning to the learning of science, all to expand civic capacity." SENCER focuses on "real world problems and, by so doing, extends the impact of this learning across the curriculum to the broader community and society." The idea is to teach "basic, canonical science and mathematics 'through' complex, capacious, often unsolved problems of civic consequence."⁴²

Bennington College has undergone a fundamental reform reorienting its curriculum towards the active engagement with real-world challenges. In the admirable rhetoric of Elizabeth Coleman (2007), former President of Bennington College, the rationale behind this reform is the following: "we plan to use the challenges themselves to inform, enlarge, and intensify a Bennington education. That is, we intend to turn the full force of the intellectual and imaginative power, passion, and boldness of our students, faculty, and staff on developing strategies for acting on pressing public needs of self-evident urgency, complexity, and importance. The emphasis on action is very carefully considered; our goal is not to study poverty, the failures of education, the abuses of force, but to do something about them." To this end Bennington created a Center for the Advancement of Public Action (CAPA), which invites students "to put the world's most pressing problems at the center of your education, or to incorporate it into your work in other disciplines. Poverty, war, the environment, public health crises, the struggle for democracy, even the state of education itself—imagine an education where the problems of the world are your subject matter and doing something about them is your aim." As a result of the reform, Coleman writes, some traditional classes are to be replaced by so-called laboratories in acknowledgement of the fact that in the "contentious, messy, contingent, constantly changing world of the practical, unlike that of the theoretical, no one is an expert and, while there are those with a vast range of experience, no one has the answers." These laboratories dealing with complex real-world problems will be co-taught by non-academic experts—"business and political leaders, journalists, policy analysts, social activists, and designers of every

⁴² See Science Education for New Civic Engagements and Responsibilities (SENCER): <http://www.sencer.net>).

stripe”—whose lives have been devoted to pressing problems in the world outside of academia (at Bennington they are called CAPA Fellows). This public action approach to the liberal arts places civic engagement at the center of students’ educational experience in order to let them find out “what it means—and what it takes—to live a good as well as a successful life.” This surely is a very attractive, but probably also very resource-intensive form of educating concerned citizens.⁴³

In 2012, the board of trustees of Stanford University published a report on undergraduate education that touches on many of the areas we have been discussing (Board of Trustees of the Leland Stanford Junior University 2012). Although the report emphasizes different points and mentions what in our opinion are key ideas only briefly, such as instruction in non-linear thinking or teaching with regard to real-world problems, the so-called “thinking-matters-courses” are, indeed, exemplary. These courses, with no prerequisites, will be required for all future bachelor candidates in all fields of study. Dedicated to a concrete idea, question or problem, they have a decidedly interdisciplinary character. The courses are created and approved by a Governance Board made up of professors from a broad variety of fields. They emphasize the importance of a multi-perspective approach and the necessity of understanding knowledge in its historical context. The sample list of potential course titles, such as “Energy,” “Evil,” “Brain, Behavior and Evolution,” “Sustainability and Collapse” or even “The Poet Remaking the World,” make clear that these courses are broadly conceived. It is an explicit objective of the report to make these courses laboratories for innovative teaching methods. Hence, it emphasizes the significance of adopting the latest technologies for teaching as has been standard practice in the field of research for centuries by now.

German and European Debates

Surprisingly, the German Wissenschaftsrat in November 2010 (Wissenschaftsrat 2010) released a report giving “Empfehlungen zur Differenzierung der Hochschulen” (Recommendations for the Differentiation of Institutions

⁴³ See Bennington College, Center for the Advancement of Public Action, <http://www.bennington.edu/Benningtonandtheworld/CAPA>.

of Higher Learning) that may—at least as far as Germany is concerned—help to create more experiments of the kind we just described. The central recommendation states that institutions of higher education should make “their regional structural conditions and the demographic dynamic a significant element of their strategy”; moreover, they should “adapt their offerings to the kind of students they are actually recruiting.” Finally, the recommendations mention that “the cultural aspects of academic institutions once again have to become a more important centre of attention.” In the German context and more broadly in continental Europe, these points are not trivial.

This emphasis on socio-cultural aspects of the curriculum is tied to the call for not overspecializing during the first three or four years in a Bachelor’s degree program. Transferring to another institution for a Master’s degree in another field should also not be made unduly difficult through unnecessary bureaucracy. Needless to say, this opportunity needs to be reflected in the financial aid structure, since the absurd practice to penalize students that move into a different discipline after their B.A. is intellectually indefensible.

In Europe, we can quickly see that the Bologna declaration itself did not have much to say about curricula and was above all concerned with structures rather than with content. But the evolution of the Bologna Process has led to a vivid discussion on quality control and accountability in teaching. While the process of accreditation is often cumbersome and bureaucratic, it has at least put the quality of teaching on the agenda. What is unfortunate is that the term “employability” in the Bologna declaration has been given a very literal interpretation. Only the occasional disgruntled op-ed points out that in our dynamically changing global environment the very notion of “employability” requires radical rethinking.

Yet, attempts to reverse the Bologna process ignore economic, social, and political realities, and therefore calls for rejecting it are not only meaningless, but tend to divert energy in the wrong direction. The next step on the path of European higher education reform is to widen the concept of “employability” so that the objective of undergraduate education is not limited to preparing students for the labor market, but to educate “concerned citizens” that are empowered to make a constructive contribution to a democratic civil society (which amongst other things requires but is not limited to economic autonomy). Paradoxically—or perhaps not—the “market” shares our view: enlightened captains of industry call for flexible, open-minded,

diversely educated university graduates, rather than narrowly trained apprentices. If the current dissatisfaction with the Bologna reform can give birth to a new unity of purpose within the European higher education community, the Bologna reform may ultimately prove to have been a first step not just towards a structural, but also an intellectual renewal of the European university system (Gaston 2010).

Optimistic Thoughts

The creation of a new curriculum has to be spearheaded by a critical mass of academics. They will not only have to develop good ideas but also be prepared to teach that which will become part of a new curriculum. They will have to abandon their present “luxury” of teaching whatever strikes their fancy. And, success will require considerable effort and courage at all levels of the university administration, from President, Rector/Provost to the deans to heads of departments. Forging such alliances for change, we believe, is a formidable, but worthwhile challenge, offering the best possibility for effecting change and for re-imagining university teaching.

Implementing our substantive recommendations will have a very real impact on the practice of teaching. In view of newly targeted aims and the transformative potential of information technologies, universities will need to engage in a fundamentally new assessment of what “university instruction” really means in the 21st century.

It is valid enough to develop new teaching structures that above all promote the free flow of information and knowledge between all members of the university community and that put students in the position to learn with and from each other. Especially teaching formats, which aim at transmitting information from instructors to students, will become, with rare exceptions, obsolete. For this to happen, professors will need to become more like coaches and mentors. Implementing information technology will help to focus on students’ needs and to guarantee intensive personal support and individualized instruction. More technology can offer more, not less, personal contact between students and teachers. In view of everything we know today about what is theoretically possible, we have to be more ambitious. We have to rise above ignorance, inertia, legal restraints, and self-interest.

CHAPTER 5

THE RENAISSANCE OF RHETORIC AND MEANING

A beautiful definition of Rhetoric is the following: “Rhetoric, I shall urge, should be a study of misunderstandings and its remedies” (Richards 1936, 3). Teaching, making an argument, reporting on research results—all of these are different uses of rhetoric, of narratives, or ways of relating a story. How to tell a story usually involves tacit knowledge. Making this knowledge explicit is one of the main tasks of the scholarly discipline of Rhetoric.

Aristotle knew it; Quintilian knew it; the scholars of the medieval university knew it.⁴⁴ In order to introduce the concept of rhetoric in the university context, let us quote the beginning of the section “Oral Communication” in Derek Bok’s *Our Underachieving Colleges* (2006, 101):

Rhetoric—the art of speaking effectively—has roots that extend farther back in history than writing. Oratory in ancient Greece was a vital part of civic life, and one that aspiring leaders had to master. Conceiving of public speaking chiefly as a means of persuasion, Aristotle codified the subject into a set of basic principles that still command attention today. The rhetorical tradition continued in Rome, where its definition was broadened beyond persuasion to become “the art of speaking well.” With its stature burnished by noted orators, such as Cicero, Seneca and Quintilian, Rhetoric came to be included among the seven essential subjects for education (the “trivium” and the “quadrivium”). The Renaissance brought renewed interest not merely in public speaking but in more intimate forms of conversation as well. Machiavelli wrote of the verbal tactics by which aspiring rulers might acquire and maintain power.

⁴⁴ Rhetoric was, along with Grammar and Logic/Dialectics, part of the Classical Trivium.

It was during the rational age of the Enlightenment that Rhetoric was banished from university curricula. For centuries the unprecedented success story in creating new knowledge in science, technology, medicine, in the social sciences and in the humanities made us believe that this omission was justified, and for a long time the need for Rhetoric went unrecognized. As a result, again in the words of Derek Bok (2007, 108), “oral communication suffers from problems of academic status ... victimized by a widespread impression that communication is a subject without much intellectual rigor and depth This is a disappointing state of affairs All undergraduates need to speak and write with confidence and style.”

But the need for renewed efforts to teach rhetoric goes way beyond the general desideratum that “all undergraduates need to speak and write with confidence and well.” In fact the reasons are epistemological and have to do with the very foundations of the disciplines and the way they have to be interpreted and consequently taught. It is epistemological in the sense that rhetoric holds the key to the way the formulation of a problem relates to its accepted solution; in other words, to what makes persuasion effective. This applies to the natural sciences as much as to the social sciences and the humanities. Actually all modes of communication and thought, such as critical thinking, forming arguments, epistemic reasoning, applying cunning reason (*metis*), practical reason (prudence, *phronesis*)—all can be subsumed under the term “rhetoric” (see especially Flyvbjerg 2001).

Medieval universities, and some of the great universities even in the 17th and 18th centuries, systematically taught Rhetoric. By the 19th century this had disappeared from the modern university. It is usually stated that students should acquire strong verbal and written communication skills—yet rarely is this objective actually achieved. The thinking behind the notion of rhetoric typically is not invoked. Thus communication is often treated as a simple, technical skill—which it is not. Communication should be built on a strong epistemological basis, according to which, we must tune how we speak or write to what we say or write and whom we are addressing. The Greeks called it “*metis*” or “cunning reason” (not to be confused with Hegel’s “cunning of reason”); this means that the answer to a problem will depend on how the question was formulated. This was always understood to be the case for law or for some subjects in the humanities, but the natural and the social sciences were considered free of this type of reasoning. It is our claim that *metis* reasoning applies to all areas of knowledge. In order to see this students must

be exposed to different arguments in different disciplines but also to the theory of Rhetoric. This topic can be introduced via classical texts like Quintilian's, or modern texts on the art of persuasion, or specially prepared studies with various disciplines in mind.⁴⁵

Some Theoretical Considerations

The rhetorical approach calls into question the usual juxtaposition of critical and practical thinking. When one studies rhetorical means in order to persuade in any discipline, much creative and original thought is invoked, although a basic critical, skeptical attitude should always apply. Similarly, when invoking "critical against practical" thinking we should insist on a critical approach to practical as well as theoretical claims and situations, and not allow the impression that practical thinking can afford to be non-critical.

How much information/data is needed for settling an argument is also a rhetorical issue. Thus the contemporary claim that the web "floods" us with information so that we lose sight of what we are seeking is misleading. It is precisely the flood of information and the theoretical availability of all this information that requires us to stop and consider what we are essentially after and what data we need. These are indeed rhetorical questions.

Communication is usually not a solitary exercise but a social one. Even if we are preparing a communication while thinking it out alone, we have the social setting in mind in which the argument will be presented. Theory, narrative, and meaning are intimately connected and they are essential to rhetoric.

Jerome Bruner's books, *Acts of Meaning* (1990) and *Making Stories: Law, Literature, Life* (2003) are, in our eyes, of central importance for understanding the role of meaning and of narrative in constructing a curriculum and thus at the very basis of university teaching in the 21st century. Bruner gives a short historical survey of how cognitive science arose, how it originally aimed at reintroducing "mind" into psychology, and how in due course it became technicized and turned from construction of meaning to processing of information. Psychology, once again, neglected meaning, and especially the

⁴⁵ To illustrate how deeply rhetoric penetrates many disciplines, we need only look at Ursula Kirkendale's (1980) study of the rhetorical structure of Bach's Musical Oeuvre.

study of the fact that meaning is socially constructed. Yet, meaning and its social origins are central to understanding disciplines, not only in the humanities and the social sciences but also in the natural sciences. In no area are we free of the need for interpretation, and interpretation is heavily meaning-dependent. The belief that cognitive processes could be run on computational devices is a kind of reductionism that is impermissible. If we wish to grapple with a complex and messy world, the idea that everything we encounter can be reduced to some basic laws or phenomena is counter-productive.

In physics this argument came up in its sharpest form in the debate between Steven Weinberg (1992) and his claim that we are on the verge of a final theory which will explain everything (except, as he humorously states himself, perhaps turbulence or life) and Phillip Anderson (1972) and his suggestion that perhaps every level of organization in nature has its own fundamental laws which ultimately are not reducible to each other. Both are Nobel-prize winners and leaders in their respective fields—so this debate is of central importance. Following Anderson’s line of argument, the eminent biologist Stuart Kaufmann published *Reinventing the Sacred* (2008) that is similarly critical of the prevalent reductionism in the sciences.

Meaning (or “mind” if you wish) must involve intentional states like believing, desiring, intending, getting a grasp; in short: everything that is important for understanding the emergence of knowledge in its historical and social context. Such an understanding then is all but impossible to achieve in computational terms. Cognitive psychology tries to fight “intentionalism,” and therefore also the concept of “agency” because it implies the conduct of action under the sway of intentional states. Only if agency implies that behavior is directed towards clear goals (seeking comparative utility) can it be computed. And only in that case is it acceptable to cognitive science. This is the centerpiece of rational choice theory, in which “we express our values in our choices ... guided by such rational models as utility theory, optimization rules, minimization of chagrin ...” (Bruner 1990).

Disciplines, or bodies of knowledge, are constituted in terms of culture. In order to teach them in their social context, we must understand the role of culture in constituting meaning. Bruner quotes Clifford Geertz (1973) who said that without the constituting role of culture we are “unworkable monstrosities ... incomplete or unfinished animals who complete or finish

ourselves through culture ... there is no such thing as human nature independent of culture." By participating in culture, meaning is rendered public and shared.

A culture's account of how "we experience ourselves and others, how people anticipate and judge one another ... draw conclusions about the worthwhileness of their lives" is what Bruner (1990, 14) calls folk psychology. It deals with intentional states and it elevates subjectivity to explanatory status.

That people cannot describe correctly their mental states, the causes of their actions, or give a correct assessment of situations is amply documented. There is indeed a discrepancy between what people say and what they do, but this does not mean that what they say should be disregarded, but rather that the "relationship between action and speech" must be interpreted. In order to do so, action and speech have to be understood—and thus interpreted—in their cultural setting. Again, in Bruner's words: "It is culture and the search for meaning that is the shaping hand, biology is the constraint" (Bruner 1990, 23). Our summary point is that if we wish to teach any discipline in its historical and social context, we must make our best effort to describe the culture in which the discipline was formed and the prevalent cultural mode of creating meaning. In other words, the proper teaching of any discipline—be it mathematics, physics, sociology or history—must be imbedded in cultural history, or if you wish, in the history of ideas. It may be a tall order, but it is inescapable.

In order to list the basic properties of narrative we shall again follow Bruner: "Its principle property is its sequence: a narrative is composed of a unique sequence of events... their meaning is given by their place in the overall configuration of the sequence as a whole... it can be 'real' or 'imaginary'... its structure is internal to discourse" (Bruner 1990, 44). That is a very important point since it is this characteristic that enables us to think of a chapter in physics or in literature in terms of narrative.

How do we explain that both fact and fiction have the same form? This question has preoccupied scholars from Aristotle onwards. Bruner's answer is that there is a human "readiness or predisposition to organize experience into a narrative form." A further characteristic of narrative in Bruner's account is its "unique way of managing departures from the canonical... Stories achieve their meanings by explicating deviations from the ordinary in a comprehensible form" (Bruner 1990, 47).

In *Making Stories* (2003, 5) Bruner quotes Aristotle in the *Poetics* to the effect that “A peripeteia, a sudden reversal in circumstances, swiftly turns a routine sequence of events into a story.” This is important for us: just imagine teaching introductory mechanics by describing a situation (Aristotelian physics) where a horse pulls a wagon. When the horse stops, the wagon stops; conclusion is that force is proportional to movement, i.e., velocity. Then we introduce Newton’s second law: force is proportional to acceleration, not to velocity. The sudden reversal of circumstances through abstraction results in a story that, in the telling, makes the development in our thinking comprehensible. You also have an engaging way of teaching. “A narrative, including fictional narrative, gives shape to things in the real world and often bestows on them a title to reality” (Bruner 2003, 8). Also important for our educational lesson is the double etymology of “narrative” to which Bruner draws attention: “to ‘narrate’ derives from both ‘telling’ (narrare) and ‘knowing in some particular way’ (gnarus)—the two tangled beyond sorting” (Bruner 2003, 27).

Reasonableness—as opposed to rationality—should become a central concept in the way we teach. It has to do with the fact that ever since the 17th century, and even more the Enlightenment, being rational was the most important sign of progress. “Rationality” and “certainty” went hand-in-hand, and both belong to the cluster of values—research values but also general guidelines for the daily life of a “modern,” progressive person—which, in our opinion, must give way to a different cluster, if we are to cope with society’s problems and if we are to teach young people to live in a complex and messy world.

“Teaching Rhetoric” or the Cultivation of Reasonableness

Until more or less one hundred years ago the confidence in science, in the scientific method(s), in rationality in every aspect of our lives, in the predictability of the world and in the ability to achieve certainty, was omnipresent and strong. Not so any more. Stephen Toulmin, the original and broadly knowledgeable philosopher of science, has suggested we cultivate reasonableness instead. This approach would replace not only the defunct “positivism” which used to rule as the central scientific epistemology, but also the attempt to reduce all scientific theories to systems of axioms. As Toulmin states

"Seventeenth-century natural scientists dreamed of uniting the ideas of rationality, necessity, and certainty into a single mathematical package, and the effect of that dream was to inflict on Human Reason a wound that remained unhealed for three hundred years—a wound from which we are only recently beginning to recover" (Toulmin 2001, 13). What is needed if we are to treat that injury is "to reestablish the proper balance between Theory and Practice, Logic and Rhetoric, Rationality and Reasonableness" (Toulmin 2001, 13).⁴⁶

Perhaps the most important Enlightenment claim, which must now be challenged, is the value of context-free knowledge. According to this view, all theoretical claims, in any discipline, are universal, i.e., are independent of time and place and therefore have "no point of view" (Nagel 1986). Revisiting this proposition is the much-needed change that we already referred to under the motto "from local universalism to global contextualism."

To reformulate it, our educational task will be to construct curricula that will emphasize the importance of reasonableness, practice and judgment, parallel to the rational arguments inherent in the theoretical material studied.

The connection between the existence of disciplines—as they emerged in the 18th century, reaching their climax of importance in the 20th—and a certain theory of rationality is obvious. Scholars in the varying disciplines believed in employing pure rationality in order to produce objective, universal truth; persuasion, the main tool of rhetoric, had no place in this theory of science. Rational choice theories, behaviorist psychology, classical equilibrium theory economics, reductionism in all its forms, helped to banish reasonableness, commonsense, pragmatism and real-life situations in general. The quest for certainty, which has driven our understanding of knowledge since the Enlightenment, has to be replaced with an education that deals with inherent uncertainty.

To once again quote from Toulmin's *Return to Reason* (2001, 204):

For the last four hundred years, the ideas of 'reasonableness' and 'rationality'—closely related in Antiquity—were separated, as an outcome of the emphasis that 17th-century natural philosophers placed on formal deductive techniques. This

⁴⁶ It is worth quoting Carlin Romano's (2010) obituary of Toulmin: "Toulmin rejected the abstract syllogistic logic, meant to produce absolute standards for proving propositions true." Instead, he argued "that philosophers must monitor how people actually argue if the philosophers' observations about persuasion are to make any sense."

emphasis did an injury to our commonsense ways of thought, and led to confusion about some highly important questions: above all the relation of the social sciences to the moral and other value-laden problems that arise in the practical professions. This stress on the rationality of formal theories or calculations, and the need for “value-neutrality” in the social sciences, was not universally accepted, but mathematical techniques have had such prestige in our discipline-oriented universities that they continued to entrench themselves well into the 20th century ... the need for rational calculations to be complemented by reasonable judgments about their relevance to particular real-life human situations faded.

Teaching science, let alone social sciences (perhaps one should simply talk of *Wissenschaft* referring to all the domains of the “*globus intellectualis*”) over the last two centuries did not explicitly involve rhetoric. The task of the natural sciences was to refine or redefine concepts in a rational way and thus to produce context-independent knowledge: that is knowledge that supposedly was independent of where, independent of when, independent of its originator and above all independent of the form in which it was communicated. This quest for objectivity led to mathematical formulations becoming the “weapon of choice” in many disciplines. Only on rare occasions was it admitted that at the moment of problem choice and once the rational part of the process had been completed, rhetorical considerations of how to teach or communicate the results have been at work. The rational and the rhetorical parts were still considered fully independent. The social scientists considered themselves the more scientific and progressive, the more rigorously they succeeded in aping the natural sciences in aim and method.

In 1935 Ludwik Fleck wrote his classic *The Genesis and Development of a Scientific Fact*,⁴⁷ which later triggered Thomas Kuhn’s *Structure of Scientific Revolutions* (1962) and was closely connected with Robert K. Merton’s *Sociology of Science* (1977). Fleck thematized the differences in the way an established “fact” is communicated to different audiences. He also introduced the concept of the *Denkkollektiv* without which Kuhn’s “paradigm” or Foucault’s “episteme” are inconceivable. This book initiated the sea of change

⁴⁷ The book appeared in 1935 as *Die Entstehung und Entwicklung einer wissenschaftlichen Tatsache*, and was translated and drastically edited into English in 1979 by T. J. Trenn and Robert K. Merton, with a preface by Thomas Kuhn.

in the cluster of values that govern our approach to science, politics or life in general.

Merton deserves our attention as well. Already in the 1930s, when he started publishing, he was much aware of the intimate connection between science and rhetoric. There is a deep ambivalence in his writing: on the one hand, he made an effort to establish the “scientific” nature of Sociology and to distinguish it from Rhetoric. At the same time, Merton admitted that rhetoric was quite important to him and, indeed, Merton’s life-long oeuvre is a continuous dialogue with rhetoric; this can easily be seen looking at his interest in and publications on propaganda and mass communication, but no less in his beloved *On the Shoulders of Giants* (1965, 218), where he studied “the rhetorical figures of elite discourse.” In fact, Merton studied the rhetorical dimensions of science in all of his works.

The essential point here is that studying the rhetoric of science is not a fancy idea of ours, but a development that has deep roots in the “scientific” 20th century.

What has changed in the last decades, however, is that today we realize the rhetoric of communication and the rational processes leading up to a discovery or a theoretical reformulation in science cannot be separated: they are hopelessly intertwined, if we like it or not. In the teaching process, this realization has to be brought out early on, and not as an aberration. When graduate students, towards the end of their studies, discover that the way they submit a paper or negotiate with a scientific journal about publication can differ significantly from journal to journal, not only in stylistic matters but very often even concerning the theoretical presuppositions that the author is allowed to cultivate, it is much too late. Journals often refuse to publish any paper that does not share their theoretical presupposition—their paradigm, if you will. This is the case in Biology (where, for example, DNA was assumed to synthesize RNA, but not vice versa until it was experimentally proven that this theory was in fact wrong), in Economics (where many journals reject any non-mainstream approach like behavioral economics, or, heaven forbid non-equilibrium economics), in Cognitive Psychology (where journals are typically stuck with the rational choice model), as well as in International Relations (where the same rationality bias that can be observed in Psychology still often prevails). In recent years there seems to be a change, though, among academics in all areas of Wissenschaft considering a return to “reasonableness”; a return to Aristotelian standards.

When looking for relevant case studies to include in an introductory course for first-year students, we might profit from using some of the chapters in the book *Science, Reason and Rhetoric* (Krips, McGuire, and Melia 1995). There is also a growing literature specifically concerned with the rhetoric of science. One of the most important scholars working in this field is Alan G. Gross, whose book, *The Rhetoric of Science* (1990; see also Gross, Hamon, and Reidy 2002), had a great impact in the field. Gross's *Starring the Text—the Place of Rhetoric in Science Studies* (2006), a reworking of *The Rhetoric of Science* is still an important source material for introducing rhetoric into the curriculum, especially in the natural sciences. Unlike much of the literature on the “public understanding of science,” his work on the place of rhetoric in science does not ignore the epistemological dimension of rhetoric. As Gross points out at the very beginning of the book:

The claim that rhetoric is an intellectual tool useful in explaining the sciences rests on an alternate epistemological vision: an insistence that science is just one way of knowing. This claim in turn rests on a fundamental federalism about the domains of knowledge. In accordance with this federalism, Rhetoric produces knowledge different from that of science, different though not inferior: knowledge of science insofar as science is persuasive communication. Rhetoric “stars” the texts, tables and visuals of science, that is, it makes their hermeneutic unraveling central. This is its role in science studies as one discipline among many joined in a common enterprise a confederation of equally sovereign intellectual states: history of science, philosophy of science, and sociology of science. (Gross 2006, ix)

For teaching purposes, there is an impressive assortment of scientific articles ranging from the 17th century to contemporary pieces published in a collection entitled *The Scientific Literature* (Gross and Harmon 2007). These should be studied together with a historical analysis of how the style and argumentation used in scientific articles has changed over the centuries (Gross, Harmon, Reidy 2002). Argumentation is especially interesting and important. Moreover, it is worth noting that the “Abstract” replaced what used to be called “The Argument” at the head of an article. The abstract is an almost mechanical listing of keywords and main points; it is not an attempt to summarize the argument of the paper. When the journal *Science in Context* was founded in 1987, one of the authors of this book re-introduced the request that each article be preceded by “The Argument.” It was amazing

and thought-provoking to see how many of the authors, having delivered their papers, had great difficulty in supplying the “The Argument” for their own papers.

A Redefinition of Critical Thinking

There is general consensus among educators that learning the capacity for critical thinking is one of the most important aims of university education. Yet there are many definitions of critical thinking. For us its most important characteristic is that it is meta-theoretical—it is second-order thinking, that is, it is thinking about thinking; it is asking the question, Why do we think what we think?

It is often tacitly assumed that critical thinking is identical with analytical thinking, part of a rigorous deductive model and thus in direct opposition to rhetoric. It is our claim that this is in fact wrong: rhetoric can be subsumed under critical thinking just like analytic and deductive thinking.

Since learning how to think critically has always been an established aim of university education, the literature on the subject is rich. We will therefore focus on how teaching critical thinking is related to teaching rhetoric.⁴⁸

What is critical thinking? It is a way to detect fallacious reasoning and to analyze both deductive and inductive arguments; it is an argumentative skill; it is a capacity to solve problems where the solutions elude empirical verification. It is studied by cognitive psychologists and philosophers using mainly informal logic—i.e., explanations rather than algorithms. Joanne Gainen Kurfiss (1988, executive summary) remarks, “When students encounter pluralism, complexity and uncertainty in college courses, they interpret it as ‘subjectivity.’” Since it is precisely the aim of most introductory courses to prevent students from encountering pluralism, complexity or uncertainty, they are all relegated to the domain of Rhetoric. One of the main tasks of teaching Rhetoric therefore is to distinguish it from “mere” subjectivity. A few lines further on Kurfiss states: “To the degree, however that critical thinking contributes to a more rational and humane society its cultivation merits a significant expenditure of educators’ collective time,

⁴⁸ For some important literature on this, see Kurfiss (1988), King and Kitchener (1994), and Barnett (1977).

wisdom and effort.” The important part in the phrase “rational and humane” is the “and.” If we simply call this reasonable, we are back to rhetoric.

Sheldon Pollock, the eminent Indologist and Sanskrit scholar, considers critical philology as a means to teach students to become “better readers of life.” With this he is referring to Nietzsche’s distinction between the Apollonian and Dionysian principle. To learn from classical texts on rhetoric is learning how “to frame the core differences (and, less productively, similarities) between the two worlds (in the one, rhetoric arose from the needs of a political or legal order, where persuasion is central; in the other, it arose from the contemplation of language as a signifying system in a political sphere where aesthetic performance was paramount)” (Pollock 2008).

As mentioned before, critical thinking is one of the very few “aims” of Higher Education—if not the only one—on which there appears to be universal consensus. Put differently, an education that avoids the inculcation of critical thinking by many would—quite rightly—not be regarded as higher education, but indoctrination. Yet “critical thinking” as it is currently being taught at most universities, is a grand narrative, disregarding Jean-François Lyotard’s (1979/1984) warning that we should exhibit “incredulity towards grand narratives.” Students should learn to be skeptical of the -isms in the world, of constructs that try to explain complex societal or natural scientific reality in an over-simplified way, such as with Marxism, neo-liberalism, or creationism.

The critical dimension here is that we should not—indeed, we cannot—limit our understanding of critical thinking as being only about finding the fallacy and then claiming one is taking a value neutral position (Lynch 2003). Moreover, as Ronald Barnett (1997, 1) “... we have to displace critical thinking as a core concept of higher education with a more comprehensive concept. The concept that I am proposing is that of critical being, which embraces critical thinking, critical action and critical self-reflection.” Indeed, critical thinking should go way beyond critical reasoning and should involve values and emotional critique as well. In short, we need to appeal to, develop and cultivate the “critical energy” in students.

In the universities, however, Barnett continues, “... we hear precious little talk about energy, excitement and commitment. Indeed, we hear little about the emotional aspects of learning. This is hardly surprising if learning is construed either as the assimilation of cognitions or as the taking on of pre-specified competencies. But without a wish to see students come into

themselves such that they invest their own utterances and actions with energy, we can never see develop critical persons” (Barnett 1997, 172).

All of this may sound abstract, yet let us remember that when scholars come to describe the university environment that they cherish, and often find it in only a few universities, often not in their own country—usually in the United States—it is typically the “energy” of the place that they are talking about. Whoever sat on the steps in front of the Alma Mater on the campus of Columbia University or watched Harvard Square on a warm fall morning will know what we are referring to. Members of all institutions should work together to change the intellectual climate of their own university in order to promote this “critical energy.”

Communicating Science to the Public

The public understanding of science—or rather the lack of it—is another aspect demonstrating the need for training in Rhetoric. An important study is *Explaining Research: How to Reach Key Audiences to Advance Your Work* (2010) by Dennis Meredith. It is not an accident but a very clever rhetorical device that the book never mentions “rhetoric”: the author knows how much public distrust exists regarding rhetoric. In an article in *The Chronicle of Higher Education*, on May 21, 2010 Meredith writes: “scientists and engineers tend to communicate poorly in public controversies because—compared with, say, doctors and lawyers—their professions have not valued explanation” (Meredith 2010b). The opposite seems the case in politics, so much so that what is said receives far less emphasis than how it is said. To illustrate academia’s failure in this respect, Meredith quotes Gallup polls that “only 39 percent of Americans believe in evolution... 48 percent say global warming is exaggerated and 46 percent say temperature increases are not due to human activity.” And this is not because Americans in principle are disinterested in science. According to the National Science Board’s Science and Engineering Indicators (2010), Meredith says, “80 percent of Americans reported that they were very or moderately interested in new scientific discoveries.”

The work of Meredith is in fact a guide for academics on how to communicate, and it provides an extremely useful, detailed list of the variety of audiences and the great variety of tools that are at the disposal of the scholar who wants to make him/herself and the topic of research broadly

understood. What Meredith does not do is to emphasize that explaining one's research in a broadly understandable way can and probably will have an epistemological influence on the communicator's own perception of the very research that he/she wants to explain. In other words: for making science understandable to different audiences, the conceptual foundations of the scientific discipline on which the research being explained is based must be illuminated. This requires thinking through and even diving into the context of discovery of those basic concepts. Nowadays, however, in much of the highest-level training in academic fields, the fundamentals are not being discussed; many of the leading scholars never felt the need to immerse themselves deeply in the foundations of their discipline. The requirement to do this in order to make academic or scientific knowledge broadly understood is the epistemological influence of rhetoric.

Since the public understanding of science—or rather of knowledge—is a matter of such importance, we would like to add a few more remarks here.

In the period of enthusiasm about technology, the relationship between science and the public was marked by trust; today, it is often marked by mistrust. Some claim that this is an exaggeration: it is not distrust across the board but rather a conditional trust—the public wants to know more and understand an issue better before deciding to give or not to give trust to the relevant agency. The hope for progress, through more knowledge, is nowadays accompanied by an awareness of the risks involved in the deployment of new technologies. Man-made catastrophes, such as Bhopal or Chernobyl or Deep Water Horizon or the Fukushima nuclear disaster as a result of a tsunami have made people aware of the risks involved in trusting technology. Where the public used to grant autonomy, it now demands accountability. It must be spelled out beforehand if an innovation could be potentially dangerous. The increased importance of knowledge in industrial societies, and thus of science and research to a country's competitiveness, has been followed by high demands for accountability and transparency. This has resulted in political fights over money and heated discussions about the purposes of research. Along with economic considerations, this development has become an important force in demanding transparency and above all accountability in science and in university administrations. As justifiable as these demands might be, we must not let the desire for accountability drive out the creative freedom necessary for true breakthroughs.

Science insists on autonomy, even if it acknowledges that the public has the right to be informed. The so-called PUSH (Public Understanding of Sciences and Humanities) program in Germany is a good example of the manifold efforts to improve communication and to bring science closer to the public.⁴⁹ As is demonstrated by the sale of popular scientific literature, this effort meets a great demand from the public. Yet all these efforts do recognizably little to settle conflictual debates like those on evolution vs. creationism or the safety of nuclear reactors. Seemingly the present mental and institutional structures of academia are not sufficient for science to regain the trust it once had. This issue is aggravated even more by the fact—in itself praiseworthy—that science has abandoned its attempt to present a unified, consensual “scientific perspective,” and is becoming more and more transparent in its own controversies.

A major task politicians and researchers are facing today is the need to reestablish trust between science and public opinion. This problem is often conflated with the general observation that the level of general trust, a key aspect of social capital and the foundation of solidarity in Western societies, is weakening.⁵⁰ While we think that a broad discussion of this issue is tremendously important, we believe that reestablishing trust between the “science community” and “the public” should be discussed separately.

First of all, society needs to realize that there are no easy explanations for technically difficult scientific matters, especially since the results are very often controversial. Researchers, however, need to explain the rationale behind their research projects and the meaning of the results. They have to spell out the socially determined problem-choice, the possible alternatives to it, the methods used and the possible outcomes—their use, meaning and the potential risks involved. These arguments are sometimes complex, but need not be difficult to follow. The public at large is by no means so primitive as to generally disregard principled, non-utilitarian arguments advocating

⁴⁹ Bundesministerium für Bildung und Forschung, Dialog Wissenschaft–Gesellschaft, <http://www.bmbf.de/de/1758.php>.

⁵⁰ Unlike Robert Putnam (1995) who posited that this is largely due to generational change, we believe that there is convincing evidence that this phenomenon is largely due to a rise of real and perceived inequality. The correlation of how individuals answer the questions referring to “inequality” and “trust” in the World Value Survey (www.worldvaluessurvey.org) and the General Social Survey (www.norc.umd.edu/GSS+website) strongly point in this direction.

research that is motivated by the quest for understanding, for coherence, for new methods, and, yes, for Truth. Making these arguments requires social knowledge. Researchers are forced to take the epistemological, communicative/rhetorical and also a political-administrative-legal context of their work into account. Ideally, this effort will improve not only understanding within the public but also a more comprehensive awareness of the researcher for his or her work.

Epistemological Considerations

What many scientists still do not realize is that the issue is not Public Relations, but a deeper understanding of the basics of science itself: all importantly the distinction between what is “pure realism” and what is socially constructed; between the rationale for a research project and the research methods that it necessitates. All too often the methodological fashion of the day dictates what questions are being investigated. To distinguish between the “body of knowledge” and the “images of knowledge” requires several levels of explanation showing why this distinction is so important today.

- 1) The scientific community has to supply convincing arguments for the demands it makes on society and funding agencies; Science, or at least “Big Science,” has become increasingly expensive. Thus society, through its representative political agents, has begun to wonder: What is the money being spent on? For what reasons and to what end? While the argument that science is in search of Truth, irrespective of its direct social relevance, has not lost all of its validity, it has certainly become weaker. The concepts underlying these demands are “transparency” and “accountability.” These are not abstract, objective criteria, but socially constructed images of knowledge. Scientists must learn to frame arguments in these terms, and this involves a rethinking of the foundations of their discipline(s) in light of real-life situations. They have to address questions of relevance, possible alternatives, opportunities and risks.
- 2) The organization of scientific research, founded on the Enlightenment consensus, has given way to deep and often open dissent in the scientific community. Recall the Weinberg–Anderson debate on whether physicists should continue searching for a grand “final theory,” or whether

we perhaps have reached a point where we have to settle for different basic laws of nature at each level of organization. Or consider the protracted debate about the need, desirability, and moral acceptability of the mapping of the human genome, until it was accomplished and thus obviated further discussion. But new ones have emerged. For example, on the accumulating evidence of the bio-medical profession's lack of ability to cope with phenomena like psycho-neuro-immunology and the public's growing reliance on alternative medicine. With the defensive walls of the scientific community crumbling, society in general is demanding more understanding, more insight and more influence on the entire research enterprise.

- 3) The various cases of scientific excess, immoral behavior and rare but highly visible scientific fraud have created a widespread feeling, amplified by the media, that society faces a potentially dangerous group of self-interested individuals that are up to no good at the expense of the public.
- 4) Finally, and not less importantly, the research ethos of the natural as well as the social and human sciences itself (the basis on which our universities have educated all students for almost three hundred years), namely the cluster of Enlightenment values, which we have discussed above, has come under severe critical attack. For a long time the Enlightenment presupposition that one could study nature and society in abstract terms—as if they were linear, predictable, context-independent, coherent and simple—did produce new knowledge and solutions to many pressing social problems. This is not so anymore; the Enlightenment program has exhausted itself, and no longer delivers according to our expectations. The “New Enlightenment” not only has to approach the natural and the social worlds for what they are—complex, messy, non-linear, context-dependent, even unpredictable—but also has to seek new approaches in promoting the public understanding of knowledge.

Society at large, and the political bodies representing society, are asking fundamental questions concerning all aspects of life, and expect publicly funded institutions—universities primarily—to supply the answers. Is there only one or are there many kinds of democracies? Can a nation come out of poverty without a strongly centralized, in fact non-democratic, politico-economic regime? How can the spread of epidemics be fought? Can classical

economic theory, which posits the same basic model of “the rational (bounded or otherwise) human being” (or *Homo Economicus*), and relies on a market, which will always return to equilibrium if left alone, cope with poverty and hunger in widely differing societies? Academics in the humanities, with their dialectic and non-reductionist approach to research, are not called upon to find solutions to these problems but rather to help guide academics in the natural and social sciences and in the technical fields along the conceptual track of the New Enlightenment.

Universities today generally are not the institutions where answers to such practical problems are being found. While individual institutes represent laudable exceptions, they remain just that, exceptions, merely proving the rule.⁵¹

Beyond the universities there are no other institutions conducting research that work on novel solutions to complex social problems. Think tanks typically conduct policy, not basic research. University-based research in the natural sciences is more easily amenable to supplying answers to such queries; for the social sciences it is more complicated. Yet, even the natural sciences have great difficulty reorganizing themselves in a way that would encourage interdisciplinary research in areas where this is the only meaningful approach that could possibly produce knowledge that may allow us to deal with the complexity of many of the challenges humanity is facing.⁵²

Rhetorical Considerations

Natural and social scientists are not trained in a way that would enable them to formulate curricula that prepare scholars to create socially useful knowledge. A very special kind of social knowledge is needed: one involving a broad cultural-anthropological understanding as well as a profound rhetoric of

⁵¹ Examples are Columbia University’s Earth Institute (<http://www.earth.columbia.edu/sections/view/9>), Stanford University and Harvard University’s joint Center for the Study of Poverty and Inequality (<http://www.stanford.edu/group/scspi/>), MIT’s The Abdul Latif Jameel Poverty Action Lab (<http://www.povertyactionlab.org/>), Harvard University’s Department of Global Health and Social Medicine (<http://ghsm.hms.harvard.edu/>).

⁵² What we are describing here is a socially constructed theory of meaning (see Bruner 1996, 1996b).

science. We are not talking about marketing or the ability to “sell” an idea, but rather of an understanding of the rhetorical structure of a given discipline or even of a complex problem. Being able to incorporate relevant social knowledge into a researcher’s own work is not part of disciplinary training. The intellectual capacity needed in order to supply a convincing argument for genetic engineering is different from that required to explain the rationale behind the construction of a chemical plant for the pharmaceutical industry or a nuclear facility, or to justify an economic stimulus package, to create an opera, to increase aid for development or to finance a space program. Social knowledge in all its forms must be embedded in the curricula across all disciplines, from the natural and social sciences to the humanities, in order to meet these challenges.

Who can create these ties? Who can teach social knowledge? Currently, essentially no one is qualified for this new task. People studying science on the meta-level, whether they are called historians, philosophers, or sociologists of science, or people working in the field of science policy are the ones closest to being able to take on this burden. In fact, it would be worthwhile to redefine the major task of the whole area of science policy in these terms.

Policy Considerations

The argument used to forge trust between science and the public very often touches on strongly conflictual issues, which science alone does not have the means to resolve. Merely ignoring the problems will create the opposite of trust. The same is true for decisions about financing scientific research and about prohibiting or regulating certain research methods or certain applications of research results. Decisions have to be made on questions such as the following: Is research involving genetic engineering permissible or not? Should we use nuclear power as a source of energy? Is the preservation of endangered species a moral imperative even in countries where the human population suffers in poverty or from hunger? Are ideologies acceptable political tools? Should the results of a scientific experiment conducted with public money be public or private property? Should research on humans that might border on or appear to border on social engineering be permissible? How far is research that is in the public interest allowed to infringe upon individual privacy?

In all these cases, decisions must be made in situations where the inherent interest of science is seemingly in conflict with those of society at large. These issues should not be left simply to the media or to evening panel discussions with retired experts, but should become material for interdisciplinary introductory courses concerning the world as it is. In addition to training cultural and quantitative literacy, integrating such real-world situations into the curriculum can help to nurture new types of literacy, such as environmental, energy and public health, even legal and financial literacy. Thus, discussions on the policies that are meant to deal with these situations should become part and parcel of the curriculum.

The study of law is rich in experience when it comes to substantive and procedural conflict resolution. In cases of conflicting interests, the law offers fair procedures and established rules that make decisions (more) generally acceptable. As Cass Sunstein (1996), a Harvard Law Professor who served in the Obama administration, put it: “people can decide what to do when they disagree on exactly how to think. For judges at least this is an important value.” This is part of Sunstein’s approach concerning the need to accept “partially theorized arguments,” another example of reasonableness and our recurring theme: the need to rethink the cluster of Enlightenment values. Sunstein states, “I will give special attention to the two most important methods for resolving disputes without obtaining agreement on first principles: rules and analogies. Both of these devices attempt to promote a major goal of a heterogeneous society: to make it possible to obtain agreement where agreement is necessary, and to make it unnecessary to obtain agreement where agreement is impossible. People can often agree on what rules mean, even when they agree on very little else.”

Besides the establishment of formal rules, there is another very important trust-building measure that we would like to call “open science” (or again, to use a more comprehensive German term, *offene Wissenschaft*).⁵³ Researchers funded by public money should be required, not in their own interests but in the interest of the common good, to release comprehensive information about their work, as well as information resulting from their work (e.g., data sets). We are not calling for the production of additional bureaucratic meta-information, serving only for the purpose of assessment—

⁵³ Akin to the already well-established movements known under the names of “open government” and “open data.”

the Research Assessment Exercise in England being the most infamous example of the latter. Instead of the existing paperwork, the workflow of science itself should be a public affair—certainly post-publication. Academia should take advantage of the opportunity afforded by digital technology of making “openness” and public availability the rule and secrecy an exception that requires justification.

Peter Galison, borrowing from anthropology, has introduced the concept of “trading zones” as a way of understanding Quantum Field Theory as areas of exchange between previously thought-to-be disconnected areas.⁵⁴ Such trading zones must be established between theory and experimentation, theory and methodology and pure research and social concerns. The problem-choices themselves must become a topic of discussion, in how we weigh “purely” disciplinary considerations—e.g., concepts like beauty, interest, importance, and proximity to the frontier of knowledge, etc.—against the public’s concern for social relevance. This discussion needs to be conducted not only within the scientific community, but also within society at large. This is a prerequisite for a public understanding of science and a trusting relationship between science and society.

The role of science journalists is of great importance here. It is not only the task of the university to train them in interdisciplinary breadth and depth; they should also be involved in teaching undergraduates, or co-teaching real-life situation seminars. They have an important role to play when it comes to translating the principles developed here into specific curricula. In short: Education policy should assure that science journalism training receives adequate support and should see to it that science journalists play an active role in designing and potentially also in delivering undergraduate education.

Cunning Reason: Metis

The intellectual preoccupation with the Greek goddess, or mental category, “metis” started with the work of Marcel Detienne and Jean-Pierre Vernant (1991). They analyse “the wily intelligence ... effective, adaptable cunning which the Greeks brought into play in large sectors of their social and

⁵⁴ This is still being developed. One should look at Galison’s *Einstein’s Clocks, Poincaré’s Maps* (2003).

spiritual life ... metis is a type of intelligence and of thought, a way of knowing; it implies a complex but very coherent body of mental attitudes and intellectual behavior which combines flair, wisdom, forethought, subtlety of mind, resourcefulness, vigilance, opportunism, various skills and experience acquired over the years" (ibid., 3). Moreover, it is applied to situations "which do not lend themselves to precise measurement, exact calculations or rigorous logic ... it is a type of cognition which is alien to truth and quite separate from episteme" (ibid., 4). Metis is very close to Aristotelian "practical intelligence" or, rather, "informed prudence." Detienne and Vernant's study follows the various uses of metis in Greek mythology, in Homer and in later literature, arguing that "[T]he philosophers' writing and teaching, as they developed during the fourth century, mark a break with a type of intelligence, which, although it continued to operate in large areas such as politics, the military, art, medicine and the skills of the artisan, nevertheless appears to have been displaced and devalued in comparison with what henceforth represented the key element in Greek learning" (ibid., 5). The authors do not consider "metis" as typical of intellectual activities such as in terms of the sciences or even of law. Preoccupations characterized by elements of deceit feature prominently in their understanding of the concept. Their formulation is quite different from the way we wish to approach this: for us, metic intelligence or metic reasoning is when the very formulation of the question influences what will be considered the right answer. In this formulation, we can indeed find metic reasoning at work not only in the social but also in the natural sciences; it involves considering the context in which the question or the problem was formulated. It is certainly prevalent in legal thinking: "metis must foresee the unforeseeable" (ibid., 27), which is typical in court situations. Our basic point is simple: metic or cunning reason has an obviously important place in the curriculum, and especially a central one in curricula that integrate interdisciplinary real-life situations.

Practical Reason: Phronesis

Phronesis is an Aristotelian concept that is closely related to "metis," meaning "practical wisdom" or "prudence." In Aristotle it is juxtaposed to "sophia" or wisdom. Phronesis is the ability to consider change and uncertain situations

which are not amenable to theoretical consideration. Yet, it is not unreflected: it involves the ability to reflect upon the practical ways by means of which changes can be introduced to make life better. Mature people, and not young people, are typically characterized as possessing practical wisdom.

As in the case of *metis*, we propose considering *phronesis* (or prudence or practical wisdom) somewhat more broadly, in order to apply it to the curriculum. Classical curricula used to emphasize practice as an indispensable ingredient of professional training. In this sense, our view of practical wisdom seeks to overcome the all-to-common separation of theory and knowing (in universities) and practice and doing (in technical and professional institutes). Learning a profession and studying theoretical disciplines must be brought much closer together, even if not made fully identical. Theoretical study must always have regard for practical application, while practical training must always illuminate the theoretical background on which practice is built. We would go even further: parallel to the rigorous, and thus by definition, theoretically-based introductory courses, real-life situations should be dealt with not only in an interdisciplinary, context-conscious way, embracing contradictions, but will also make an honest attempt at teaching the skills of the *bricoleur*. This would give us a “Jack-of-all-trades” who has the mental flexibility to make creative use of available resources in a variety of different contexts (Lévi-Strauss 1996).

CHAPTER 6

NEW CURRICULA AND NEW DISCIPLINES

The task of undergraduate education is to prepare young people for concerned citizenship in a complex and messy world. As the world is uncertain and unpredictable, so too are the challenges it poses. Hence knowledge must be created in a way that grapples with this reality and is not restricted by the cluster of values of the Enlightenment. Curricula that can teach this type of knowledge are the foundation of what we call the “New Enlightenment.”

This opens up a need for rethinking the disciplines themselves, in a very fundamental way. Our concern here is not to prescribe this curriculum but to draw attention to these issues and to give significant examples in various disciplines as to the direction this rethinking should go. We understand that even this modest attempt may look presumptuous, and therefore we would like to stress that these are tentative examples, which first and foremost are meant to serve illustrative purposes.

The Crisis in the Humanities: A Never-Ending Controversy

In his book *The Marketplace of Ideas: Reform and Resistance in the American University*, Louis Menand (2010) raises the question: “Why have the humanities undergone a crisis of legitimacy?”

First of all, let us remember that this is not a recent phenomenon. After 1945 an unprecedented growth of the entire higher education sector occurred, first in the United States through the GI bill and the incorporation of former soldiers into civilian life after 1944, and later in Western Europe in the 1960s. In comparison to the natural sciences and some of the social sciences, the humanities played a relatively minor role. The basic question about the “use”

of the humanities, however, significantly predates this expansionary phase of higher education.

Except for those, relatively few, intellectuals for whom any learning is a “good in its own right” that does not require any further justification, people have always singled out the humanities for being seemingly “useless.” In fact, classical humanistic subjects, such as rhetoric, were primarily cultivated for their practical importance, more than for their intrinsic scholarly value, and yes, beauty.

Rabelais, in his *Gargantua and Pantagruel*,⁵⁵ ridiculed scholars for their lack of common sense, their verbosity, their ignorance of basic values and their general disrespect for simple people. That wise humanist, Michel de Montaigne, repeatedly argued that philosophy, literature, history—unlike the sciences—do not need a special jargon or vocabulary, which then constitutes an obstacle for the non-scholarly readers to understand them. For Montaigne, “this great master of life” as Virginia Woolf describes him, communication with all and being understood by all, is one of the most basic characteristics of being human and thus of the “Humanities.”⁵⁶

One of the arguments supporting the critics (to some extent) is that too many unnecessary publications appear. Unlike in some of the data- or experiment-driven natural and social sciences, where an additional experiment or another case study may be at least of marginal utility, mediocre products in the humanities are for the most part meaningless.

Much too often the humanities are seen as obscurantist, as unserious or simply unnecessary. Indeed many critics complain that the humanities’ scholars publish too many unserious, unnecessary and obscurantist articles of marginal utility and more often meaningless.⁵⁷

Such criticisms are not new. Alain de Botton (1999) offers the following insight: “An unbiased reader opening one of their books and then asking himself whether this is a tone of a thinker wanting to instruct or that of a

⁵⁵ There are very many editions; a recent one is a translation by M. A. Screech (2010).

⁵⁶ See Virginia Woolf’s beautiful essay “Montaigne,” in *The Common Reader*, University of Adelaide, 2015 edition. For an insightful reading of Montaigne, a magnificent biography should be mentioned: Bakewell (2010).

⁵⁷ Perhaps the most infamous such criticism occurred in 1996, when physicist Alan Sokal published an article in the cultural studies journal *Social Text*. The article was filled with references and footnotes, but was essentially a hoax, missed by the journal’s editors. Sokal’s discussion of the incident can be found in Sokal (2008).

charlatan wanting to impress, cannot be in any doubt for more than five minutes; here everything smells of dishonesty ... from every page and every line, there is an endeavour to beguile and to deceive the reader, first by producing an effect to dumbfound him, then by incomprehensible phrases and sheer nonsense to stun and stupefy him, and again by audacity of assertion to puzzle him, in short to draw dust in his eyes and mystify him as much as possible.” The words are not de Botton’s, but a quotation from Schopenhauer (1851), writing about Hegel, Fichte and Schelling in *Parerga and Paralipomena*. In short, attacking the humanities for a predilection of obscurity is also not new.

Back to Menand (2010). He raises four questions: “Why is it so hard to institute a general education curriculum? Why did the humanities undergo a crisis of legitimacy? Why has “interdisciplinarity” become a magic word? And why do professors all tend to have the same politics?” (Menand 2010, 16). The first three of these are at the core of our preoccupations, and therefore it is worth looking at Menand’s arguments.⁵⁸

General education is a central issue for all undergraduate education. The kind of curriculum we are advocating here can also be legitimately seen as a curriculum in general education. When we talk of the real purpose of undergraduate education as the education of concerned citizens for a democratic society, this requires some form liberal, general education.

In their book *Rethinking Undergraduate Business Education*, Anne Colby, et al. (2011) advance the central thesis that for all professional education, in this case business, the precondition for success is the combination of specialized courses with general education courses. The subtitle of their book is “Liberal learning for the profession.” A widespread worry of most American educational commentators is that the liberal arts college is an endangered species, and in this context “general education” and “liberal arts education” are generally treated as one and the same thing. Whether we are looking at the “distribution” model or the “core” model of general education, the discussion is focused on the selection of the courses that have to be included. Yet, on this question faculty can almost never reach an agreement, because the vested interest of faculty members—who typically tend to consider their own discipline as indispensable—prevents any easy consensus. Since, as

⁵⁸ For an interesting perspective on the question, why are professors so liberal, see Fosse and Gross (2010).

Menand (2010, 32) states, “general education is the public face of liberal education,” such ongoing, unresolved and perhaps insoluble infighting can have disastrous consequences.

Our point is that considering the problem as one of a selection of courses is misplaced. Liberal or general education has to be a basic attitude towards the importance of fulfilling a basic purpose of education, which emphasizes theory and practice, the social and political context, the impact on the development of the individual and moral issues, all of these penetrating every single course or cluster of courses, regardless of whether we are talking about the humanities, the social sciences, the natural sciences, or professional education.

To establish this kind of curriculum is a massive undertaking, necessitating a critical mass of scholars who work together in preparing courses, trying them out, while willing at the same time to learn from mistakes by introducing subsequent changes.

Although Menand does not make this proposal, he does say “any liberal arts field can be made non-liberal by turning it in the direction of some practical skills ... conversely, and more importantly, any practical field can be made liberal simply by teaching it historically or theoretically” (Menand 2010, 55).⁵⁹

The Role of the Humanities in the 21st Century

Since, in our opinion general or liberal education should be part of all undergraduate education, the distinctly American practice of requiring a B.A. before letting students go on to professional schools or other advanced degree programs is, in fact, exemplary. In Europe the argument used to be that secondary schools educate at such a high level that after graduation, students will have absorbed all that is necessary in terms of general education. This is patently no longer true. The results of the OECD’s Pisa assessment indicate that the school system or its students are no longer what they used to be.

⁵⁹ The Princeton historian Anthony Grafton (2010), in a critical book review of Menand’s book, strongly resists Menand’s downplaying of specialized knowledge leading to the claim that the humanities are about “simple problems simply solved.” What worries Grafton is that too liberal a conception of education may lead to the neglect of disciplines and disciplinary rigor.

More importantly, however, it is evident that secondary education has changed comparatively little, while the world has changed tremendously. So even if schools were doing a good job in terms of general education, those in charge of post-secondary education must grapple with the fact that students today may in fact require much more by way of general education than their grandparents or even their parents did. Sending immature, far from well-rounded 18-year-olds into Schools of Medicine, Law, Engineering, Business or Theology borders on irresponsibility. So while we believe that there is a need to reform undergraduate education in the United States, undergraduate education in Europe should introduce three to four year long pre-professional programmes.

Still, we are left with the question: What is it that is meant by the crisis in the humanities? The “crisis” is often described in terms of waning financial support for the humanities, disappearing departments, closing institutes and lowering enrolments. But there is more to it. Even before the financial support began to fade, the humanistic disciplines themselves started looking for something like a rationale for their existence. Suddenly the “what for” question became legitimate. Menand mentions that in wake of the Sputnik-shock in 1957, the United States poured billions of dollars into science teaching, and economists such as Gary Becker and Theodore Schultz introduced the concept of “human capital.” Strikingly, the humanities were left out of the very concept of human capital. As a result, by 2001 in the wake of September 11, when one would have expected that the United States would pour large sums of money into research on religions, cultures and languages, nothing happened. The American army arrived in Iraq and in Afghanistan with barely a handful of experts who knew the languages, the cultures and the religions of these regions; hence they were essentially unprepared to face the challenges of operating in regions that were culturally alien. The disastrous consequences of this lack of preparation are well-known.

There is a very lively literature in defense of the humanities, especially in Germany, where the *Geisteswissenschaften* (Humanities) have a glorious past, and historically its universities used to cultivate them as the primary ingredients of culture. In the famous reforms of Schleiermacher, Alexander and Wilhelm von Humboldt in the early 19th century, it was clear that philosophy was the only independent, culturally central, socially perhaps irrelevant domain and as such the main gatekeeper of academic freedom in

the university. The crude, materialistic demand to cultivate only the “useful” areas of knowledge, which recently has been enjoying much currency again as a consequence of the budget squeezes in the wake of the financial crises, primarily in the United States and in England, is much less common in the German academic world.

It was as recently as 2007 that Germany named the year *Das Jahr der Geisteswissenschaften* (the year of the humanities) resulting in a vast literature on the so-called crisis of the humanities being produced (e.g., Welzer and Heidbrink 2007). As an example, let us take a look at the *Manifest Geisteswissenschaft* (2005, written for the Berlin-Brandenburgische Akademie der Wissenschaften, BBAW by leading scholars of the Academy, Carl Friedrich Gethmann, Dieter Langewiesche, Jürgen Mittelstrass, Dieter Simon and Günter Stock). They formulate their recommendations in 10 theses, which are important and insufficient. That is, the Manifest notes clearly that the humanities are in crisis, but—as is so often the case in debates about the disciplines—misses the full dimensions of the crisis and what can be done about them.⁶⁰

For example, the Manifest defines the humanities as the study of cultural forms of the world and emphasizes that new knowledge emerges at the boundaries between the existing disciplines. Such a view separates the natural and social sciences from culture, which hardly makes sense. Loosening the boundaries between the existing disciplines is also admirable, but says nothing about the institutional politics to preserve the narrowly defined existing disciplines. It calls for the establishment of so-called *Exzellenzzentren* (excellence clusters or centers) and indeed this has become reality in many universities. However, there is in the Manifest not enough awareness of how little such centers influence the rest of the university. It recommends the founding of independent institutions for publications and critical editions of major works of great scholars from the past. But this neglects the serious danger that separating out these editions from the interdisciplinary milieu of research teams in universities or academies would generate collections of works without considering the socio-political context in which they were created. The opportunity of open online collaboration unfortunately goes without mention. There are still other proposals, but we think our point is

⁶⁰ It is important to note that the Manifest believes that only the humanities are in crisis. Obviously, we believe the crisis is widespread through the social and natural sciences as well as technical and professional fields.

sufficiently made: Even when an illustrious group takes on the crisis of the humanities, the tendency is to think too narrowly, too rigidly, and without a clear sense of the institutional and organizational realities and limitations of the universities they want to change.

In summary, our main criticism of this important document is that it essentially ignores the structural problems of the universities as far as contents and curricula are concerned, and it makes no mention of the opportunities afforded by the digitalization of the field. It nostalgically refers to the Kantian–Humboldtian ideal of seeing the real home of the humanities in the so-called “Philosophische Fakultät.”⁶¹

In our opinion, the humanities, under attack, have been putting up a feeble defense for themselves. Especially in Great Britain, academics in the humanities have been under heavy attack by arguments such as those advanced in the Browne Report with only a few, though prominent, defenders (Collini 2003, 2010, 2011). We mostly hear only an almost whining argument, which amounts to saying: “we are so small and so cheap, let us live.” Academics in the humanities must rediscover their self-confidence, asserting that their disciplines make decisive contributions to our basic understanding of who we are and where we came from. In their paper “What are Universities for?” Boulton and Lucas (2008) put the argument much more forcefully: “The humanities are concerned with what it means to be human: the stories, the ideas, the words that help us make sense of our lives and the world we live in; how we have created it, and are created by it. They give voice to feeling and artistic shape to experience, exploring issues of morality and value. The social sciences attempt to deduce, through scientific observation, the processes that govern the behavior of individuals and groups. They are thus crucial to the creation of effective social policy.”

The humanities have in methodology always been closest in thinking to the approach that we label the New Enlightenment. Many in the natural sciences could learn something from those in the humanities and social sciences in terms of certain concepts and methods and in the way they approach research problems. They have never sought consensus, do not abhor contradictions, are usually not reductionist, but dialectic in their mode of thinking, and have always emphasized the context-dependence of their findings. Thus those in the humanities have in fact always practiced New

⁶¹ In contrast, see Martha Nussbaum (1997).

Enlightenment scholarship. It will be the task of the humanistic disciplines to help the natural sciences and some of the social sciences to acquire what—to them—is a new mode of thinking.

Some Examples: Economics and Psychology⁶²

The eminent challenge in the field of economics lies in the integration of a fundus of economic theories that combine mathematics and other areas of formalized economic analysis with henceforth neglected psychological factors as well as social values, goals, norms and social ideals. This is a necessary prerequisite so that economics can offer practice-relevant answers to current societal needs and economic problems. We maintain that as currently constituted conventional economics teaching does not have the intellectual tools needed to address, for example, complex subject matters such as poverty. Some institutes do try to make economics relevant for research on for example poverty, but the existing experiments that have been implemented and the theories that have been developed fall way short of being numerous and radical enough.⁶³ Instead, a gatekeeper mentality seeks to protect vested interests.

Young economists, who are determined to try new paths, are controlled through implicit mechanisms and discouraged by mainstream economists. They are made aware that their careers are in danger if they do not follow the implicit and explicit rules of the field, such as the mathematical formulation of an argument. This is also true for the new disciplines such as behavioral economics.

Prevailing economic theory is based on the idea that the markets are, if left alone, self-regulating, even though reality shows that the opposite is often the case. Serious economists and some thoughtful investors like George Soros have repeatedly pointed out the inadequacy of this theory and demonstrated that they understand phenomena such as the financial crisis, its causes and possible solutions, far better than the “great” mainstream economists who

⁶² An insightful discussion of how the academic disciplines developed after World War II with negative consequences for undergraduate education, see Lazerson (2010, ch. 5).

⁶³ The collaborative work between Stanford and Harvard in the Project to Focus on Poverty and Equality in America, Columbia University’s Earth Institute as well as the Poverty Action Lab of MIT are praiseworthy exceptions.

have won Nobel prizes for their abstract theories but who are always in disagreement with their colleagues as to practical political problems. It is then necessary to create a New Economics, which integrates concepts from the social sciences and the humanities into mainstream economics.

There is a great irony in this, because economics in the last half of the 20th century achieved enormous academic status within universities, certainly when compared to other humanities and social science disciplines. The discipline's ability to apply mathematical models and statistical analyses to economic problems succeeded in replacing economics reputation as a dismal science. But this very strength, as Marvin Lazerson (2010, 131) writes "subordinated economic history, ethics and normative judgments, and the direct observation of the real and messy world to theoretical mathematical models The economic literacy necessary for an educated citizenry was not the responsibility of the academic discipline of economics."

The financial crisis of the past few years has provided significant empirical evidence strengthening this view. Many have been trying. George Soros has been waging a persistent fight against the idea that markets inevitably lead to equilibrium and that markets know best. His formulation, borrowing from Karl Popper, was that it is the reflexivity of human affairs—the interplay between actors in a social context—which brings about this disequilibrium. Lately he has been giving support to several departments, which are meant to cultivate a New Economics. In order to foster a new type of thinking, Soros has financed departments and institutes at Columbia University and the Central European University as well as at Oxford and Cambridge universities, all dedicated to the teaching of a New Economics. It is not enough, however, for these institutes to be led by one or two rebellious Nobel laureates. We need new positions for future economists who are given a kind of intellectual protection so as not to fall prey to the pressures of mainstream thought.

Our hope is that this will not only result in a new type of research, but also in new curricula for teaching economics even to undergraduates. For example, the economics of poverty should be amenable to new theoretical approaches along the lines of Amartya Sen (1982b, 1992, 2002) or Arjun Appadurai (2004, 2006), which would integrate economic thinking with theories of culture and historical studies on aspirations and norms.

It is more difficult to illustrate the needed reform in teaching the other social sciences. There is little doubt that the reform will insist on liberating

these fields from the clutches of methodological individualism as well as of “rational choice theory” and of reductionist explanations of social situations, which result in a problematic emphasis on abstract, context-independent, universal theories, which are far from real-life situations.

The important collection of essays entitled *The Flight from Reality in the Human Sciences* by Alan Shapiro (2005) argues the same point. Shapiro’s critique is that the human and indeed the social sciences encourage a flight from reality: “In discipline after discipline, the flight from reality has been so complete that the academics have all but lost sight of what they claim is their object of study. This goes for the quantitative and formally oriented social sciences that are principally geared toward causal explanation. Following economics, they have modeled themselves on physics—or at any rate on a stylized version of what is often said to go on in physics.” The search for the one best theory or the one best method makes no sense in a messy world with multiple ways of understanding. As Shapiro (2005, 9) continues,

“I take the core commitment of scientific realism to consist in the twofold conviction that the world consists of causal mechanisms that exist independently of our study—or even awareness—of them, and that the methods of science hold out the best possibility of our grasping their true character.” This is indeed a flight from social reality (Green and Shapiro 1994).

Rational choice theory is closely connected with game theory and with what is called “methodological individualism.” Due to the strong insistence in the social sciences to consider only what is measurable, and the attempt to “ape” the natural sciences in their methodology, so-called serious and rigorous scholarship in the social sciences ignores broad, qualitative theories like those of Max Weber, Emil Durkheim, and Georg Simmel. As a result these great theories are rarely presented in courses of sociology proper, but are relegated to the history of ideas. Even when certain theories have become disproven, it is still important to confront students with alternative approaches and applications.

Another field that requires a restructuring of the curriculum is cognitive and experimental psychology. The discipline is still dominated by positivist and reductionist approaches, while context and meaning are neglected. Almost obsessively psychologists dedicate themselves to Rational-Choice Theory. Similar phenomena can be observed in the field of political science. Constructivism, for example, has won in importance over time, but in

general young academics find the intellectual course they must take already charted out for them.

Our recommended reforms in cognitive psychology must lead to a useful theory of meaning. Jerome Bruner (1990, 1996b, 2003) has often convincingly shown that psychology, cognitive science and other related fields have neglected and overlooked the meaning or the semantic dimension of language for the sake of syntax, and that meaning is socially constructed. The general failure to incorporate this view into cognitive psychology rests in deeply rooted systematic missteps, false incentives, and even at times explicit bans on the institutional level.

In order to find the means and ways for epistemological reform in psychology and its related fields, the “system” must encourage young, innovative academics to move within risky and uncharted research territory. But the reality for future scholars has been, despite the rhetoric, the opposite. General support for “innovative thinking” has often turned out to be simple lip service as it usually only allows for a certain kind of innovation that stays within the narrow confines of conventional theory. The “moral” reasoning for this is to protect young academics against failure that could jeopardize their careers. They are advised to put off research in unknown territory until they have become more established in the field. But this means abandoning some of the most productive and creative years in a person’s professional career. Doctoral candidates are not given the incentives or appropriate space, infrastructure, or the necessary means to carry out and publish innovative and groundbreaking research in their field. Universities and academies are therefore called upon to take a careful look at their compensation and hiring systems to incentivize proper and necessary risk-taking that include rewards for productive failure. Innovative and productive academic work can take many forms.⁶⁴

⁶⁴ One could make a similar case in the study of linguists. Heavily influenced by Chomsky’s (1965, 1968) semantic-based research, historical and comparative linguistics became reduced to minor areas of study—at best. Recognizing Chomsky’s enormous contributions, it is nevertheless important to revive comparative and historical studies of languages, particularly regarding elements of language that have a formative influence on the social and cultural differences between people and groups of people. See, e.g., Vygotsky (1987), Dor and Jablonka (2010), Deutscher (2010), and Evans and Levinson (2009).

A New Curriculum for the Natural Sciences

In order to embrace the New Enlightenment, and irrespective of whether they are natural or social scientists, academics need to learn to embrace contradictions and to give up the hope for absolute certainty. Instead, they need to realize that qualitative (not measurable) issues are central not only to scholarship but also to the world in which we live. In these contexts traditional positivist methods only go so far.

For the natural sciences the situation is both easier and more difficult. To develop an integrated undergraduate curriculum in the natural sciences is an extremely complex task, since it would need to cultivate trying to understand the sciences as a body of knowledge. It would have to ask what constitutes scientific thought, why is it different (or not) from daily thought, what are the connections among the sciences, why must we know something about physics, chemistry, biology even as we recognize that seeing the sciences as separate entities makes less and less sense in the New Enlightenment.

Still many experimental curricula exist that are worthy of our attention. Especially advanced are the life sciences in the United States, where in some universities the various relevant departments were eliminated and replaced by schools and institutes of life sciences. Yet, even these are having great difficulties in constructing integrated undergraduate curricula. An interesting case study here is the School of Life Sciences at Arizona State University (ASU). There an integrated graduate curriculum has been developed, and they are laboring on developing an integrated undergraduate curriculum in the life sciences.⁶⁵

The historical memory of those working on experimental curricula seems rather short. It would be well worth the effort for many of us to become reacquainted with the series of new teaching programs that were developed in the wake of the Sputnik shock in 1957. Back then the United States made huge investments in developing new curricula to deepen the learning of science in secondary and post-secondary education. Much of what we are suggesting can be found in those programs: the Physical Science Study Committee (PSSC), the Biological Sciences Curriculum Study (BSCS),

⁶⁵ See the National Science Foundation's Science Education for New Civic Engagements and Responsibilities (SENCER).

the Chem Studies, the New Math, and the Harvard Project Physics. All of these curricula emphasize the conceptual foundations, describe the historical roots of the central ideas, and raise epistemological questions.

In the natural sciences, unlike the social sciences and the humanities, model textbooks exist that have been written by great scientists who also happened to be teaching wizards. In physics, arguably the most important such textbook is *The Feynman Lectures in Physics* (1963), first delivered at the California Institute of Technology in 1963 by Nobel laureate, Richard P. Feynman, and protocolled by his students and colleagues.

A parallel study of Herbert Goldstein's *Classical Mechanics* (2001) and Cornelius Lanczos's *The Variational Principles of Mechanics* (1968) would offer students a deeper understanding of the fundamentals of physics, even if no reference is made here to epistemological questions. Many more examples of this kind could be given; however, most of these books are restricted to one discipline or even a sub-discipline, and typically do not focus on real-life situations or the rethinking of the foundations on an epistemological level. It would be useful to rediscover the lost tradition of epistemological analysis in the teaching of all disciplines.

Recognizing and Promoting Quality: A Challenge Spanning across Disciplines

As already mentioned above, the Humanities and Social Sciences (HSS) have been grossly neglected, which becomes evident in particular by looking at comparisons with the natural sciences and technical fields in terms of the dramatically lower faculty to student ratios.⁶⁶ In promoting research in the HSS, we face a culture of accountability that raises questions about how one may define excellence in these areas? Often the hypocritical question is posed as to whether work in these disciplines can be objectively measured. Who should be entrusted with judging quality in these disciplines? Are there areas of research that could in any appropriate sense be judged as more relevant than others? Do policy considerations apply to them at all? Are some areas of research mere hobbies approached with determined zeal?

⁶⁶ In terms of financing, we should point out that the problem has less to do with research funds and more with personnel costs. The Humanities need time more than money to do research, or rather, to formulate innovative ideas clearly.

Behind all these questions is the unfounded presupposition that we do not have the same fundamental problems in the natural sciences and technical fields: as if we always knew exactly how to assess them, what constitutes excellence, who should judge them and by what measure, how they are relevant and how to decide what policy recommendations flow from them. We would like to analyze both perspectives below.

Most research in the HSS can be assessed exactly the same way as any research in the theoretical natural sciences: in comparative analysis though the same methods applied in the scientific community, that is, by way of standards of quality checked through the judgment of leading academics in the field. We look at the cogency of the presuppositions, and the coherence of the arguments and at the degree of certainty with which they relate to consensually accepted theoretical statements from previous research. It is not just in case there are mathematical techniques involved, or data have been amassed, or statistical arguments have been used that we have to assess the quality of the methodology employed.

There is no automatic way to judge the truth-value of what we are presented with in any discipline. Cogency, coherence, consensus, technical reliability are all subject to interpretation and to the accepted norms of intellectual communities, which arrive at their agreed upon consensus in a complex social process. Research findings that are in accordance with accepted norms are “images of knowledge.” This distinguishes them from what is called a “body of knowledge” which is considered as independent as possible from socially determined norms. All this does not mean that “anything goes” or that there is no reality. “Objective reality” as we encounter it in our (context-determined) experience cannot be ignored. But the distinction between the “real” and the “constructed” is not a sharp one; our perception of reality (that is our experience) and theoretical presuppositions and judgments are strongly interwoven. Let us point out only one glaring example: the entire edifice of modern science is rooted in Newton’s breathtakingly daring decision to put at its base a two-body law of force, which was to become the basis of mechanics. However, in nature there is no such thing as a two-body situation: it is an abstraction that, while of enormous importance, is ultimately the brainchild of the human mind. Is this Newtonian decision a case in point for constructivism or for realism?

An argument in any humanistic discipline, even if it is considered relativistic in impact, can be rigorous and should be judged like other argu-

ments in the sciences. An argument in the humanities can use established philological techniques, reliable (or not) supporting theories, controllable references and translations, etc. The experimental natural sciences are seemingly on much safer ground for assessment, because experimental results seem to be amenable to direct and unambiguous evaluation. Yet, much of what goes into the setting up of an experiment, as well as the decision upon the theoretical basis of the setup, the definition of what exactly constitutes reliable results, and so on, are all based on interpretation. As demonstrated by standard philosophies of science, no experiment can be repeated solely on the basis of what a scientific paper describes. The tacit knowledge involved is enormous, and it is impossible to spell it all out. As Michael Polanyi (2009, 4) has stated, “We can know more than we can tell.” Moreover, as Douglas Thomas and John Seely Brown (2011, 77) have put it: “tacit knowledge, which grows through personal experience and experimentation, is not transferable—you cannot teach it to me, though I can still learn it. The reason for the difference is that learning tacit knowledge happens not only in the brain but also in the body, through all the senses.”

It works well within the consensus, until at some stage the relevant scientific community decides that a certain discrepancy is important enough to reopen the underlying theoretical assumptions. So one real difference between much of science and the humanities is in fact the early (17th-century) decision to build up a new science around consensus and a seeming general acceptance of a ruling theory, or paradigm that is independent of political and religious controversies. This is the core theme of all theories in the “scientific revolution.” The paradigm rules supreme and quells dissent as long as it proves satisfactory. Such a decision was imperative for creating credibility, and later fundability of the natural sciences, which always were, and increasingly so, are much more expensive than the HSS. Such a quest for consensus never existed in HSS. Here the co-existence of differing interpretations and theories can be a permanent and satisfactory, even desirable state of affairs. In fact, this is perhaps the only significant difference between the natural sciences and the HSS.

It seems obvious that arguments in the humanities or the social sciences can rarely be presented succinctly. It is also seemingly obvious that in the natural sciences it is easy to find a convincing and concise answer to a problem by just “looking at the facts.” Yet this is only seemingly so. The process of interpretation and context-dependent considerations that go into

a “scientific result” is enormous. Due to the long-standing tradition of consensus, these complex considerations are eliminated from the stated argument and delegated to the domain of tacit knowledge.

Until recently, assessment of research in all areas was subject to individual judgment of the leading specialists in the relevant field. It was accepted that in every field certain individuals were considered better equipped at judging which piece of proposed research is to be relied upon, deserves credibility, and thus, which researcher deserves continued funding on a smaller or larger scale.

Exercising judgment, undemocratic as it may be, was the prerogative of those deemed the best in a field. This was not an absolutely safe, ideal or fully reliable procedure, but it worked well enough for a long time in all areas of research. However, this way of judging work has allowed for the “best and brightest” in a field to serve also as gatekeepers and often to prevent innovative ideas and new ways of looking at “established” knowledge.

What has changed? The simple answer would be the scope and the style of funding research. As science and research require ever more resources, the demand for professionalized accountability has understandably increased. In a general atmosphere of growing democratic accountability—in itself a very positive political development—the granting agencies were obliged to become more transparent, their decisions more democratic, and thus they increasingly came to rely on decisions reached by professional committees. The arguments justifying funding decisions became socio-political in nature and were increasingly couched in terms of direct relevance to the common good, policy considerations and an evaluation of alternative grant-making areas. Yet many of the most serious social problems are not being dealt with even today; the problems taken up tend to be those that are technical and solvable, while the strategic issues which would require us to rethink the basics and which are far from being obviously soluble are neglected. Such arguments are seemingly based on the social consensus. Hence, the recent trend towards democratization of scientific activity and the growing emphasis on accountability involving not only the elite, but the majority of the scholarly community in assessment and quality control. While the motivation behind this development seems clear and reasonable, a consequence of it is that there is little room for individual judgment and creativity. This development has certainly not opened the system up to innovative, counter-trend ideas, but in many cases created a “culture” of mediocrity.

We would like to point out something we think should be obvious. What is relevant is what is being said and not who is saying it. Young academics should not be judged on the basis of their status, their publication list or the importance of their supporters but rather on the intellectual quality of their ideas. This is one of the central themes of this book.

Where does this leave us in terms of the questions confronting us? As with any system of checks-and-balances, there is no one perfect recipe for academic governance. It will require a continuous effort of design, re-design and muddling through to arrive at a solution that is acceptable to both the academic community as well as society at large.

First and foremost, it is important not to separate sharply the natural from the social sciences and the humanities. In very many areas of research they are in need of strong mutual reinforcement. In the biological and medical sciences the social factor is so blatantly obvious that we cannot even conceive of discussing them separately. In the very definition of disease, historical, cultural and social factors prescribe interdisciplinary research.

Statistics is a special case in point. Most training of statisticians is such that even if they are well prepared in mathematics, they lack any kind of social and biological knowledge to the extent that they can only begin their work at the stage when all of the data have been collected. They work with what may be called “data-cemeteries” instead of playing a constructive role in setting up the questionnaires that typically form the basis of empirical research projects. Training statisticians, who will also be well versed in sociological and/or biological thinking, is a new task for a reformed curriculum.

There is no research, in any domain, where the question “what follows” does not apply. Moreover, the answer to “what follows” by definition constitutes policy. Yet, in most areas of research, including the natural sciences and technical fields, those who perform the research are not necessarily the best equipped to draw policy conclusions. Policy studies thus are a social science par excellence. They deal with all social issues and with research results produced by all disciplines. Therefore, it will be the task of the new curriculum to teach the foundations of many disciplines as well as advanced research at the graduate level in connection with important policy questions.

This brings up an interesting historical reminder: In the 19th century, wonderful research was done in the universities in seemingly “irrelevant”

areas like classical Eastern languages, cultures and religions; at the time this was motivated by policy considerations, and the “research output” was meant to be put to immediate use by the great colonial powers to further their colonial interests. The School of Oriental and African Studies in London is probably the most visible reminder of this development.

At first glance, research in the natural sciences and technology will always seem more immediately useful than the research conducted in HSS. Yet, usefulness is not a static category. Apart from the meaning of knowledge in itself and the indirect use of a better understanding of human culture, it is, as has been emphasized here, important to recognize that many if not almost all the fields of study in the humanities are intimately connected at one or more levels with the natural sciences and that they, the natural sciences, have something to learn from them.

It is a problem for policy implications of research that results cannot be anticipated. For funding purposes it is therefore of vital importance that all research proposals are assessed by those individuals or committees who are most qualified to do so. Unfortunately, in most granting agencies the first round of selection is considered a mere administrative task. The scholarly evaluation usually comes in only after the pre-selection has been finished. This is a very dangerous procedure. Very often the most important decisions as to which research proposal will be considered at all happens in the pre-selection stage. Also the initial decision as to which proposal goes to which evaluating body is done at this early stage, while this decision should ideally be reached by the senior scientific evaluators. Only the senior scholars are capable of recognizing worthwhile proposals, which happen to be outside the familiar boxes, and only these can decide whether a proposal is of an interdisciplinary nature, for which, possibly, no evaluation committee exists. It is often the proposals which fall into this latter category of intellectual risk-taking, that need to be most urgently encouraged. This is important not only in order to encourage innovation, but even more so because in the most important interdisciplinary areas of research, disciplinary methodologies tend to break down.

A few examples: in most areas concerning public health, social and cultural factors seem to play a central role. With regard to, for example, the biological transmission of infectious illnesses, the accepted scientific methodologies become relevant only once a bio-pathway has been indicated. The bio-pathway often is unknown. Yet, the immediate need to conduct research

investigating a public health problem does not allow us to wait until the bio-pathway is determined, so that in many cases we act to the best of our knowledge until the transmission route is found. A historical example of this would be how Ignaz Semmelweis experimentally realized that if people caring for women in labor washed their hands, the mortality rate of the mothers would drop dramatically. However, this was not implemented into general practice until Joseph Lister and Louis Pasteur developed the germ theory. This illustrates the significant relationship between theory and practice. The same is true for the cultural components occurring in the economic considerations on poverty, or of climate research (Duffle and Banerjee 2011; Wilkinson and Pickett 2010). Courageous interdisciplinary research that is prepared to accept the risk of failure is practically a moral imperative in many of these areas!

Extreme caution is recommended when it comes to the use of bibliometric measures to assess quality. In most areas, but especially in HSS, the scholarly work on the interpretation of bibliometric data is still poorly developed. Bibliometric indicators are at best useful for entire disciplines, or countries, but rarely for individuals or small research teams.

Because we are describing an enormous undertaking, which could take decades to bring about, we see this as another reason for teaching a New Enlightenment to first-year students, as a way of preparing them for the future direction in academia. Students should be shown that looking at real-life situations in society is the path to take in producing genuinely new and meaningful research.

The Establishment of New Scholarly Disciplines

In most of the world higher education and, in particular, curriculum research, practically do not exist as scholarly disciplines in their own right. The United States, the United Kingdom, Great Britain, the Scandinavian countries and the Netherlands stand out as exceptions. The demand that a critical mass of scholars should work on new curricula presupposes recognition and funding of such work as a scholarly activity. There are several reasons for these prerequisites, but one of the most important and acute reasons is the fact that young scholars can not afford to spend time and intellectual energy on anything but disciplinary research, if their efforts are to be awarded

recognition. This is currently rarely the case. Thus the question is: How to introduce such a new field?

The problem is a well-known one in the sociology of science, a discipline that studies the establishment and legitimization of new disciplines or research areas. Robert K. Merton (1977) dedicated a retrospective essay to this topic. On the question of what it means to establish a discipline, Merton quotes Edward Shils (Merton 1970, 763):

By institutionalization of an intellectual activity I mean the relatively dense interaction of persons who perform that activity. The interaction has a structure: the more intense the interaction, the more its structure makes place for authority which makes decisions regarding assessment, admission, promotion, allocation. The high degree of institutionalization of an intellectual activity entails its teaching and administered organization. The organization regulates access through a scrutiny of qualification, provides for organized assessment of performance, and allocates facilities, opportunities, and rewards for performance—for example, study, teaching, investigation, publications, appointment, and so forth. It also entails the organized support of the activity from outside the particular institution and the reception or use of the results of the activity beyond the boundaries of the institution.

Merton originally and importantly goes beyond the development of mere skills and insists that institutionalization should be seen in terms of an interplay between developing cognitive and professional identities in the new field.⁶⁷

Quite often the need for a new discipline arises because genuine collaboration between two or more existing disciplines turns out to be practically impossible: the main obstacles are the conservative “gatekeepers” or, in the words of Merton (1977, 34), “the enormous social and cognitive distances in the academic organization of the disciplines ... that have blocked reciprocally useful exchange.”

The problem can be put in other terms: in the case of a new discipline, there are no giants on whose shoulders the newcomers could stand.⁶⁸

⁶⁷ This approach was adumbrated in an earlier piece by Ben-David and Randall Collins (1966) and expanded upon more fully in Thackray and Merton (1972).

⁶⁸ The reference is to Newton’s very famous quote: “If I have seen further it is by standing on the shoulders of giants.” Letter to Robert Hooke, 15 February 1676—or in the old

In our case, the fact that the discipline of Higher Education Studies barely exists and where it does, is dominated by the Anglo–Saxon world makes introducing reforms both easier and more difficult. It is easy because there are ample institutional models to copy. In other words there are ample giants on whose shoulders one can stand. On the other hand, it is more difficult because the gatekeepers, due to their reluctance to copy from elsewhere (the “not invented here” mentality), will not absorb or adapt strange or foreign ideas and concepts.

In any case, the first task is to assemble a critical mass of scholars, dispersed as they may be in different institutions and in various departments, who are interested in working together on creating institutional innovation. This is hard lobbying work for the few individuals who are the motors behind this activity. Naturally, the task would be much easier if private foundations, and possibly the administration of a few universities, were willing to endorse and support the program.⁶⁹

Before one could contemplate the creation of new disciplines, gatekeepers of the existing disciplines have to be brought to a point where they are willing to admit that a point has been reached where rethinking is necessary. This is a long process, and the university leadership will have an important role to play in it. In a sense the latest financial crisis has brought economists closer to admitting that rethinking is necessary. Some leading scholars such as Nouriel Roubini, Joseph Stiglitz, Edmund Phelps, and Robert Schiller (even when he warns not to throw the baby out with the bath water) probably have reached this point (see Kay 2012). Other mainstream economists, however, are still among the most headstrong and dogmatic “gatekeepers.” As so often the case, journalists are the ones who dare to say the obvious both clearly and loudly. Uwe Jean Heuser (2012), a staff writer for *Die Zeit*, opened an article with: “Gebt zu, ihr wisst es nicht—Ökonomen koennen die

calendar system: 5 February, 1675. See Merton’s charming and scholarly, *On the Shoulders of Giants: A Shandean Postscript* (1965), as he calls it, where he traces the historical roots of Newton’s aphorism.

⁶⁹ Establishing the discipline of higher education research is enormously important in implementing our recommended reforms and represents in certain respects a key in creating the central research areas for the universities of the 21st century, and in creating a new context-sensitive area of academic study and a new political theory, a new biology, a metac-oriented (emphasis on meaning) new psychology and a historical and comparative new linguistics. Such research is then of socio-political importance.

Bewegungen der Wirtschaft kaum vorhersagen. Wer das akzeptiert, macht die bessere Politik” (Admit it, you don’t know—economists cannot predict the movements in the economy. Who accepts this will craft better policy).

If and when such new disciplines will have been created and become part of the departmental structure of research universities, today’s tripartite division of the university into faculties of natural sciences, social sciences and humanities will have to yield to a new structure.

Francis Bacon had foreseen this development, calling for a “*globus intellectualis*.” His ideas are presented in his “*Instauratio Magna*,” which criticizes the state of science of his times and searches for a principle of inventing new knowledge. This new knowledge should replace both the verbose, older, medieval approach to knowledge, but also the mindless collection of separate facts that makes it impossible to realize the gaps in knowledge. According to Bacon, all this is due to the incorrect division of the sciences.⁷⁰

Bacon looked for the true direction of science and is unhesitatingly teleological, finding that if the aim is well stated, then a new classification of the known and the unknown sciences must be undertaken. The “*globus intellectualis*” is the result of this new classification, becoming the basis of his whole philosophy. In his 1620 “*Plan of the Work*” from the “*Great Instauration*” he states that “In laying out the divisions of the sciences however, I take into account not only things already invented and known, but likewise things omitted which ought to be there. For there are found in the intellectual as in the terrestrial globe waste regions as well as cultivated ones. It is no wonder therefore if I am sometimes obliged to depart from the ordinary divisions. For in adding to the total you necessarily alter the parts and sections; and the received divisions of the sciences are fitted only to the received sum of them as it stands now” (Spedding, Ellis and Heath 1968, IV, 22–23). This passage leads us directly from the relevance of the “*globus intellectualis*” of Francis Bacon to the need for introducing new curricula to

⁷⁰ Already in 1591, in a letter to Lord Burleigh, he makes the famous statement, “I have taken all knowledge to be my province; and if I could purge it of two sorts of rovers; whereof the one with frivolous disputations, confutations and verbosities, the other with blind experiments and auricular traditions and impostures, hath committed so many spoils I hope to bring in industrious observations, grounded conclusions, and profitable inventions and discoveries; the best state of that province.” See Spedding, Ellis and Heath, eds. (1968, 108–109).

the undergraduate program of universities in the 21st century. Bacon is deeply committed to the belief that the wrong division of the sciences is arguably the main reason for their barrenness—and in our case for the inadequacy, and indeed partial barrenness of the present curricula.

Bacon's philosophy has been much discussed by historians of ideas, though conclusions are rarely drawn from his work with respect to the state of science in our own day, let alone for problems of higher education. One of the very few in-depth treatments of the "globus intellectualis" for 20th-century science has come from F. N. Heinemann's (1944, 242–260) paper of the same name. Heinemann asserts that emphasis on quantitative knowledge at the expense of serious study of qualitative aspects, the neglect of practical aspects of knowledge and lack of concreteness in theoretical studies, the neglect of values, and the dogma that facts and values can be fully separated, all contributed to one-sided developments of the sciences and actually created an obstacle to progress. As Heinemann puts it: "Modern science has indeed separated what ought to be united and has united what ought to be separated."

Global Contextualism and the New Enlightenment: Guidelines for a Meaningful Renewal of Teaching

The curricular innovations called for in this book should serve in reassessing or rethinking the Enlightenment and its legacy. Educating first-year students in specific disciplines is still worthwhile. However, a new division of the "globus intellectualis" would help end the one-sided emphases on, for example, purely mathematical models in economics, on methodological individualism in many of the social sciences, on rational choice theories in psychology, political science and economics. Instead of separate, context-independent universal theories in all disciplines, we advocate interdisciplinary theories that embrace global contextualism—that is to say, we advocate a point of view that considers knowledge everywhere in its specific socio-political-environmental-historical context.

It is encouraging to see that the paradigm of interdisciplinarity is increasingly becoming popular wherever purely disciplinary research reaches its limits. Yet, what we still need to develop is an awareness of the fact that most of the greatest challenges facing humanity do in fact require close,

practice-oriented transdisciplinary cooperation. This awareness then has to find its way into the actual practice of teaching.

For example, medical education and legal education should be reformed along these lines, which may in fact amount to introducing new disciplines. As Lee Shulman (2005b) emphasizes, in the “characteristic forms of teaching and learning,” what he has called “signature pedagogies,” “the novices are instructed in critical aspects of the three fundamental dimensions of professional work—to think, to perform and to act with integrity.” What he criticizes is that these three dimensions do not receive equal attention across the professions, “Thus, in medicine many years are spent learning to perform like a physician; medical schools typically put less emphasis on learning how to act with professional integrity and caring. In contrast, most legal education involves learning to think like a lawyer; law schools show little concern for learning to perform like one.”

In another article Shulman (2005) tells the following anecdote: “In law classes dealing with damages (torts) someone raises a hand and says, ‘I know that is the law, but it doesn’t seem fair.’ And all across the country the professor responds ‘this class is not about fairness, it’s about the law.’”

In most law schools—including the best and most famous ones—in America, Europe, and Israel, the professors of introductory courses for law students emphasize that law is not about morality. This abstract approach was defended as a proper way of teaching legal thought or reasoning and of training better lawyers; the troubling question is whether today, after the cases of Enron, Worldcom and Andersen, Lehman Brothers and other financial services and Banks, FIFA, Volkswagen and so many other scandals, as well as years of financial crisis, this type of education is still deemed acceptable. We believe it is incorrect to teach what is legal without allowing students the chance to discuss what is right. If the curriculum in schools were thus conceived, within the framework of these ideas, the result may, indeed, be the creation of an entirely new discipline.

In an article appearing in the *Frankfurter Allgemeine Zeitung*, Peter-Alexis Albrecht (2009), a professor at the Goethe Universität in Frankfurt am Main, called for a far-reaching curricular reform of legal education in Germany. He recommends abolishing lectures where professors “preach the gospel” to 400 students—some less bored than others. Even more important from our point of view is his demand that the whole of European legal theory should be rethought: “Reform here means that academic teaching should not be

professional training in the sense of simple and applied techniques. We are talking about a comprehensive general education, an interdisciplinary conception of all social references to the legal professions and critical reflection and all of this within a European context.” Albrecht goes further, stating: “An orientation with regard to fundamental concepts and interdisciplinarity requires an accompanying program of ‘general studies.’ This would impart knowledge on, among others, the sociology of law, philosophy of law, argumentation and logic as well as a nuanced conception of European legal cultures ... Moreover, it is about competence in the fields of economics and political science.” Absolutely in line with our way of thinking, he states, “without practical experience there is no reflexive learning” (translated from German).

One of the more important books on the education of lawyers, is an important study sponsored by the Carnegie Foundation for the Advancement of Teaching (Sullivan et al. 2007). It shows how the scientific training of lawyers came about and how with it “the relation of legal activity to morality and public responsibility received even less direct attention in the curriculum.”⁷¹ The authors formulate this as follows: “Whatever the merit might be of value-free knowledge, it cannot be said that this knowledge is taught by value-free experts.” A process has started—by no means widespread enough as yet—by which the rational epistemology “emphasizing objective quantitative measurement ... a premium on formal knowledge abstracted from context” is yielding to a new epistemology of practice: “starting from engagement rather than a claim of detached objectivity, this epistemology of practice aims to enlighten and enhance professional work through critical analysis.” This new epistemology of practice is not hostile to theoretical formulations and generalizations, but rather makes clear that there is an intricate relationship between theory and practice (see Sullivan 2007; Shulman 2005).

Many of the same criticisms and opportunities can be made with regard to the education of engineers, medical doctors, and nurses (Sheppard et al.

⁷¹ Unlike in Germany, American law students at least enter law school with a B.A. in general education coming from any number of backgrounds in terms of schools of thought, methodological approaches and curricula. This contrasts sharply with, for example, the situation in Germany, where both law and medical students practically do not receive any form of general education. This model necessarily fails to provide students with a broader perspective where it would be crucially needed.

2009; Cooke et al. 2010; Benner et al. 2010). When considering one of our central recommendations, that of teaching real-life situations, the field of engineering would be an ideal partner, especially when students work in small groups. There is scarcely another discipline that must rely so systematically on real-life situations as engineering. As Sheppard et al. (2009) argue, the current curricular approach emphasizes individual “building blocks” but fails to help aspiring engineers network the pieces into a cohesive whole.

Medical education has a long tradition of reform. Ever since the Flexner Report of 1910 (Flexner 1910, 1925b), medical training has become more science-based. In practice, this meant that in most medical schools the first two years are dedicated entirely to basic science courses, with the next two years emphasizing clinical instruction. This rigid separation has been changing in many medical schools in the last twenty years. In some programs, medical students are allowed to visit the patients’ beds from the very beginning. The Medical School of Ben-Gurion University in Beer-Sheva, Israel, was one of the pioneers in this approach. In Germany, Witten/Herdecke should be mentioned here. A number of major medical schools in the United States have made treating patients and clinical education central to students’ learning early-on. The medical curriculum, though, is still heavy on the natural sciences. Whenever a dean is approached with advice that the curriculum is missing some important elements, the standard response is “you are right, but how can we add anything more to this curriculum?” The obvious answer to this is that some things have to be taken out of the present curriculum.

By way of illustration, let us point out two important lacunae in medical education: Firstly, in most medical schools evolution is not being taught. For all infectious diseases, knowledge of the evolution of the parasite is as important as human evolution with which it is entangled. Recently, following the work of Randolph Nesse and George Williams (1996), a whole movement is underway to introduce evolution into the medical curriculum. After a fruitful collaborative year of several scholars working together as Fellows at the Berlin Institute of Advanced Study (Wissenschaftskolleg zu Berlin) in the academic year 2007/8, a new scientific journal was founded.⁷²

⁷² “EvolutionAndMedicine.org.” From the advertisement of the journal: “An appreciation of the fundamental principles of evolutionary biology provides new insights into major diseases and enables an integrated understanding of human biology and medicine

Secondly, the other lacuna is the lack of a course or other form of systematic treatment of the desired balance between the results of “evidence-based medicine,” the experience of the clinician and the narrative of the patient. There is at best tacit awareness of the problem.

The question of what could be removed from the current curriculum is a vexing one. How much anatomy does the general practitioner need? How much pharmacology should the medical student study, considering the fact that modern medicines are so complex that what the pharmaceutical industry prepares, even if it publishes the chemical contents of the medicine, is no longer understandable to the physician. These are all the kinds of questions for the experts—in the professions, the natural and social sciences, and the humanities—and now is the time that they begin to look for answers.

... we consider these evolutionary principles in conjunction with population genetics ... coupled with complementary insights offered by advances in genomic, epigenetic, and developmental biology research, evolutionary perspectives offer an important addition to understanding disease.” See Nesse and Williams (1996).

CHAPTER 7

RETHINKING THE UNITY OF RESEARCH AND TEACHING

Teaching Quality: Taking Stock of the State of Affairs

Among the few undisputed aims of the university—past, present, and future—are research and teaching. In the United States these aims are pursued by a broad spectrum of public and private institutions of higher learning (post-secondary institutions): community colleges (where about 45% of American undergraduates are enrolled), two- and four-year colleges, liberal arts colleges, professional schools, comprehensive and research universities. The community college model, which in our opinion is the greatest American contribution to higher education, has been adopted in other countries, unfortunately though without sufficient adaption to local needs. In Europe, a few small liberal arts colleges have recently been established; globally, however, most institutions of higher education are modeled after the research university with its dual-focus on research and teaching.

There are more or less generally accepted ways to measure research capacity and thus there is little doubt as to which universities are the leading research universities in the world. It is also more or less public knowledge that teaching in research universities is a “second-class-citizen.” This does not necessarily mean that teaching is poorly done, just that it is a secondary companion to research. The different accreditation agencies do not shy away from warning even the most famous universities that if they do not work on improving the quality of teaching, their accreditation may be in danger. Yet, the suggested remedies do not go very far. Even when they are implemented, they do not address the causes of the problem. There is general regret that students rarely have contact with the prominent scholars in their chosen course of study; many classes are taught by underpaid adjuncts or, in

Germany, by the so-called “Mittelbau” (non-professorial teaching staff); in the great research universities the “stars” can get a sabbatical every few years and not, as it used to be until recently, once every six or seven years or they simply “buy-out” their teaching time with research grants. All this is done in order to encourage more or even better research, which then results in more prestige and research grants for the university. In the American system this can include substantial overhead funding of the whole grant, allowing the institutions to finance a substantial share of their overall operating expenses from research grants.

The neglect of teaching can be explained by simple arithmetic: within the framework of traditional instruction the student to faculty ratio at most universities simply does not allow for “high touch” instruction. According to research on learning success, class size has no decisive influence on the quality of teaching. Yet, while it may not show in test scores, it seems reasonable to assume from personal experience that there is a difference between seminars with, say, 15 students as compared to those with 60 or over 100 students. A reasonable class size allows for personal engagement and actual mentoring in and outside the classroom. With a group size of more than 40 or 50 people, the marginal utility of “being there” as opposed to, say, watching a recording of a lecture diminishes dramatically. In one extreme case, it is reported that at the Vienna University of Economics and Business, the faculty-student ratio was 330 to 1.⁷³

Under these circumstances it is time to rethink the model. Classes, which for the most part take place online, allowing for “contact hours” to be devoted to work on problem sets and discussions in smaller groups, appear to show great promise. For graduate studies, an even lower student to faculty ratio is necessary, since high quality teaching on the graduate level demands an intimate knowledge of the interests and capabilities of students and their respective research projects.

It is also the case that most universities lack adequate mechanisms of quality assurance. The quality of instruction by underpaid adjuncts, lecturers and graduate assistants, who generally do much of the teaching, may not live up to desirable standards—not least because even the most dedicated and skilled individuals in the teaching profession are often simply overburdened.

⁷³ “WU hat die schlechteste Betreuung aller Unis” (Vienna University has the worst supervising ratio of all universities), see *Die Presse* online, 25 January 2010.

Professors meanwhile often teach between 6–8 hours a week. Every now and then they are on leave for a research project. Some teaching assistants, who are often counted as teaching staff to make the faculty to student ratios look better than they actually are, usually teach a few hours per week, sometimes not every semester and occasionally not at all.

What this means is that the quality of instruction most likely suffers from a de facto student-to-faculty ratio in the majority of universities that is much higher than what official statistics suggest. For many instructors, it becomes practically impossible within the current structure to know the names of their students, let alone their interests, preferences and temperaments. In the traditional mode of classroom instruction knowing these things, however, is critical for good teaching and effective mentoring. In many ways teaching in higher education today is reminiscent of a religious rite. What matters is that it is performed irrespective of its effectiveness. In the current system personal advising, individual coaching or mentoring are simply not part of the instructional model. If they do occur, it is rather by coincidence or because of the laudable engagement of individuals going the extra mile. But unfortunately they cannot be said to be default features of mass higher education today.

The “Publish or Perish” Paradigm and its Effect on the Quality of Teaching

The public discussion of teaching vs. research has become polarized. There are the conservatives, who usually consider “the student” as some sort of enemy, and the reformers, who think “the professors” are to blame for their cynical and egotistical neglect of teaching. This is the case in many countries. Gwyn Morgan (2010), a Canadian business leader and outspoken voice regarding many social issues, described the problem in an editorial as follows: “Frosh-week frivolities have ended and some 40,000 new university students across the country have experienced their first weeks of classes. Unfortunately for many, those classes have brought frustration and disillusionment. Poorly prepared professors stand before huge classes delivering basic material readily available elsewhere. Many professors show up only occasionally, sending harried, low-paid graduate students to teach so they can concentrate on their personal research. Assignments can be poorly thought out, often bearing

little resemblance to material covered in class.” The tone is harsh but not unusual. The fact is the situation at many universities is alarming.⁷⁴

While the description of the state of affairs is generally correct, there is little analysis of the underlying reasons. Yes, professors give mass lectures that bore students and provide little information beyond what could more easily and more effectively be delivered through carefully thought-out digital teaching materials. Yet, it would be unfair to claim that the disinterest or laziness of teachers is responsible for the problems of quality in teaching. Young faculty are left little choice when it comes to prioritization as their promotion and prestige—and thus often their very livelihood—depend on their publication records. The lower status of teaching is simply a rational response to the current incentives in academia. The solution here surely cannot hinge upon reminding academics of their civic responsibility in asking them to sacrifice their career in the name of abstract moral principles. This would be neither just nor expedient.

Academics employed in institutions of higher education nominally receive their salary for teaching and research. But hiring criteria for faculty make it very clear where the priority lies from an institutional perspective. Nevertheless in addition to the 6–8 hours of teaching, professors at universities are expected to do long hours of administrative work and other committee work, much of it dealing with students’ needs. Naturally, in a situation where the student to faculty ratio is as described above, there is in fact little time left for research. In the relatively few privileged institutions, with low student to faculty ratios, a teaching load of 6–8 hours should leave the necessary time for research. Instead of complaining, and demanding the creation of more positions so that professors could have more time for research, we would like to pose the heretical question of whether it is in fact necessary or even desirable that every professor be given sufficient time for research and publishing? If we consider the current quality of most scientific publications—and we have little hope that anything would change if only professors would be given more time and resources—it appears to us that

⁷⁴ This observation is backed up by personal experience: The students in the International Relations program at Dresden University of Technology faced the envious contempt of some of their fellow students as the department afforded them the luxury of placing a 40-student cap on their seminars. See the critiques in Taylor (2010), Hacker and Dreifus (2010), and Bok (2006).

from a public policy perspective the current emphasis of research at the expense of teaching is simply not defensible.

There is a strong, albeit impressionistic, suspicion—and we are fully aware of how controversial this claim is—that in most disciplines (difficult as this is to measure), a high percentage of the papers published are not worth the effort—not to say the paper on which they are printed.

The Impact of the Science Citation Index

The Science Citation Index (SCI), which involuntarily set-off the “avalanche” of publishing since its creation in 1964 is a very important tool. Research in history or philosophy, and especially in the sociology of science, is heavily reliant on it. As early as 1955, one of the creators of the SCI, Eugene Garfield, recognized that what was missing from the research enterprise was a way of measuring and communicating research output via a citation index (Garfield 1955). A few decades later Robert K. Merton (1977, 47) recognized the importance of publications for the status, fame, and intellectual property of scientists as well as “... the distinctive or seemingly paradoxical circumstance that, in science, the more freely the scientist gives his intellectual property away, the more securely it becomes his property.” Teaching always was a matter of local value or appreciation and hardly contributed to building a scholar’s reputation. In hindsight it thus seems self-evident that publications should have become the most important means for assessing the quality of faculty and consequently for creating his or her reputation and for becoming the standard in career advancement and financial reward.

What began as an unwanted and unplanned by-product of the SCI, counting citations became a widespread practice and the “controlling variable” in determining the promotion of scholars. In fact, while the number of citations has grown exponentially, it is probably the case, that much of the cited research is of low quality. Writing in the *Chronicle of Higher Education*, Mark Bauerlein and colleagues (2010) from different disciplinary backgrounds explained the problem based on empirical data: While the Citation Index is not the only measure, and arguably not even the best one, it is still meaningful that “[o]nly 45 percent of the articles published in the 4,500 top scientific journals were cited within the first five years after publication.” In other words, nearly half of all publications are never cited by anyone at

all! What this means is that the reduced teaching load for professors who publish work that is of little value—even to their peers—amounts to a massive subsidy of (not just in a narrow utilitarian sense) unproductive activity.

Moreover, “the number of ‘refereed academic/scholarly’ publications grows at a rate of 3.26 percent per year (i.e., doubles about every 20 years).” On the basis of these facts the article makes an important point: “Not only does the uncited work itself require years of field and library or laboratory research. It also requires colleagues to read it and provide feedback, as well as reviewers to evaluate it formally for publication. ... Younger scholars waste precious months reviewing a pool of articles that may lead nowhere” (Bauerlein et al. 2010).

In short, the opportunity costs of “publish or perish” are enormous. A vicious cycle sets in wherever greater numbers of journals incentivize young researchers to produce ever more publications in order to keep up with their peers. Additional research in a sense produces the opposite of a public good: the increasing number of papers published spread quality ever thinner, requiring libraries to subscribe to an ever greater number of journals. Some speak cynically of the Least Publishable Unit, or the lowest amount of new knowledge necessary for churning out yet another publication.⁷⁵ Thus, a lot of money is siphoned out of the system to provide access to mediocre material. Bauerlein and colleagues conclude that “[o]nly if the system of rewards is changed will the avalanche stop” (Bauerlein et al. 2010).

Three suggestions seem to be good first steps to address the issue: 1) limit the number of papers taken into account in the decision to grant tenure; 2) make more use of citation and journal impact factors (“quality over quantity”); and 3) do not rely on the number of pages as an indicator of quality. Taking the so-called “impact factor” into account makes the assessment somewhat better, but not much. When relying on the citation index, one could demand an in-depth citation analysis. Limiting the number of pages published in peer-reviewed journals seems to be a good first measure to prevent sheer quantity from becoming more important for promotion decisions than actual content.⁷⁶

⁷⁵ This neologism has its own Wikipedia entry.

⁷⁶ This is reminiscent of a lecture delivered by a Soviet academic at the Kiel research institute for economics in the 1970s arguing that the Soviet Union would ultimately

It is against this backdrop that we point out the plight of university teaching. The infrastructure is in a pitiful state, the lecture halls are overcrowded and the professors publicly decry the problem of quality in teaching, at times out of sarcasm, at others out of desperation.

If the amount of time (and money!) spent on producing publications classified either as “hobby horses” or “resume tinsel” were dedicated to teaching, little of value would be lost. On the other hand it would result in a substantial, budget-neutral improvement of undergraduate education. While the percentage share of papers that add little or no value may be debatable, it is clear that the opportunity cost, i.e., the benefits lost from not spending that time on teaching, is enormous.

Lurking behind this discussion is the big, controversial question: Do we as a society really want or need the publications of the between 500,000 and one million (depending on whom you include) professors—tenured or on tenure-track—who all teach less than they could or should, in order to do research?

We need to keep in mind that the mass university and the 500-seat lecture hall are consequences of this avalanche of low-quality publications. If a large portion of the time academics spend on producing these publications were to be dedicated to teaching, this would allow for an essential, and budget-neutral, improvement of teaching. Faculty would teach smaller classes, offer more courses or would have more time for providing guidance to students outside of the classroom.

If professors are genuine about their concern for the quality of teaching, they should not be simply pushing for more money, but rather for more time in the classroom and an elimination of research and publishing requirements. This burning question, so carefully avoided, of what society wants and what it needs must be openly discussed.

To clarify: We are not talking about “usefulness” of research in a short-sighted utilitarian sense. And we do not suggest placing limits on certain types of research. Every academic question pursued with a passion, for the sake of learning, and driven by insatiable curiosity, is a legitimate contribution to humanity’s endless quest for knowledge. This is the case irrespective of whether we look at the sciences, the social sciences or the humanities.

come to dominate world affairs, because it was already publishing more books than the United States.

Besides this categorical argument history has shown time and again that even the most esoteric ideas (think of number theory for example) may turn out to be useful and should therefore not be discriminated against in favor of applied research. But we are convinced that the idea of opportunity cost somehow has to be brought into this important public policy debate.

What does it mean when publications are no longer being read or acknowledged, not even by the small group of “cognoscenti” in small, specialized research areas? Clearly there is no obvious answer to this question. Unfortunately, we find little writing in the field of higher education studies that dares to point out this problem. There is only the very impressionistic answer we could receive by asking as many scholars as possible, and preferably those scholars whose research is both respected and deemed necessary. The level on which this approach could be applied is to ask independent groups of leaders of the profession in every discipline, how much of the research done in their area of expertise they consider worthwhile. Here it is important to differentiate between daring, risky but ultimately failed research and unnecessary research. Ideally all granting agencies, and all refereeing committees, should be asked to distinguish between research which they refuse to fund because it is too risky, or too weakly argued, or not satisfying the criterion of “doability,” etc., from research proposals which in their view should not have been proposed at all. Moreover, these judgments and the reasoning behind them should be published not only in the interest of accountability and transparency, but also because this kind of feedback would serve a valuable educational function for all involved.

Obviously, this problem varies from discipline to discipline or even from sub-discipline to sub-discipline, as does the usefulness of mediocre research results. Paradoxically, it is typically successful professors, presidents or provosts of elite universities who write the literature on research results. They look around in their distinguished milieu and find that a great majority of their colleagues are doing high-quality research and many of them even do a good job teaching. Hence, they are often unaware of the average mediocrity prevailing in the whole system. Very few of them are capable, or even interested in looking at this problem from the point of view of the thousands of universities and the hundreds of thousands of professors—many of them of average talent by definition—or from the point of view of the many thousands of periodicals very few of which would ever be considered an appropriate venue for the publications of the research elite. But when we

look at the overall picture, we cannot help but realize how much of that which is published today is in fact less than mediocre. We believe that many academics currently “forced” to conduct research would actually prefer to teach more, provided their livelihood was secured and they were not stigmatized as academia’s second-class citizens. Universities should establish a culture where striving for teaching excellence is seen as an opportunity, as well as a privilege. For that we need rigorous quality criteria, meaningful evaluations (e.g., peer review) and competition in order to increase the level of social prestige in teaching.⁷⁷

Research is Not the Measure of All Things

Diane Auer Jones, former President and CEO of The Washington Campus, a business school consortium, has argued “It would be a shame to lose sight of the educational mission by layering additional research responsibilities on teaching faculty members.” With the pressure to do more research, the “grant application growth vastly outpaced budget increases” (Jones 2010). Low success rates have made it necessary to submit even more applications, producing a vicious cycle that “also creates a low tolerance for the kind of risky science that often yields the greatest benefits.” Perhaps a shrinking federal R&D budget could “force a productive refocusing of the research effort among a smaller group of research-intensive institutions.”

But the real losers in the research-obsessive climate are the students. Though we share in the basic belief of the National Science Foundation (NSF) that undergraduates should be exposed to real-life research problems, this is more an option than a requirement. We also have to consider the opportunity costs. What is the trade-off to exposing students to state-of-the-art research infrastructures? The question that also needs to be raised is what else we could do with these resources, had they been invested directly into improving the quality of teaching. One may well conclude that neither the research results of the professors nor the knowledge gained by the students can justify “the high cost of establishing and maintaining a research program at a mainly undergraduate institution” (Jones 2010).

⁷⁷ The positive effects such a competitive environment can have can be observed in the various “Teach for All” programs around the globe (www.teachforall.org).

All of this means that almost everywhere parts of universities will have to be restructured and dedicated first and foremost to teaching. This represents an opportunity. In her conclusion, Diane Auer Jones (2010) makes the unusual though important point that “enabling faculty members to select between a research or teaching track might improve job satisfaction.” Moreover, “[t]his shift will require institutions to develop promotions and tenure policies that evaluate and reward performance based on teaching or other scholarly work rather than on grant and publication success.” It is gratifying to see that job descriptions and hiring practices have begun to change in recent years taking into account the quality of teaching among possible candidates, though of course still far from of equal importance.

In order to enable teaching professors to be considered equals to researchers in terms of social prestige, they must have the same salary scale, the same promotion procedures and the same academic “perks” like sabbaticals, tenure, library access and relevant budgets. Even this may not be enough, and it is the task of the university administration to devise creative ways to foster the necessary intellectual atmosphere that is the *sine qua non* for such reform efforts to succeed.

How the Research Imperative Determines the Quality of Teaching

The effects on teaching of the manic drive to publish are not only felt in terms of time. Since Humboldt, the mantra repeated in any discussion on higher education is that professors must engage in innovative research in order to become good teachers. This idea is rooted in what we believe to be a false and now antiquated interpretation of the unity of research and teaching.

That professors need to conduct cutting-edge research in order to be good teachers is only partially true. It holds only for the 3–5% of students and faculty who dedicate, or wish to dedicate, their life to top-tier academic research.⁷⁸ For the rest, the principle behind the unity of teaching and

⁷⁸ As the unity of research and teaching is counted amongst Humboldt’s hallowed principles, it should be noted that today’s select few who do end up in research would have, in Humboldt’s day, constituted the bulk of those who even made it to university,

research needs to be broken down into its basic elements and viewed from a relative perspective.

Professors often identify more with their discipline and its research agenda than with their university and its teaching mission. The rigid division of disciplines at universities allows people in separate departments to see themselves more as belonging to independent fiefdoms rather than to the university as a whole. This makes interdisciplinary teaching based on real-life situations for example rather difficult and leads students to see their college education as something divorced from the real world.

Good and interesting teachers are characterized by a lively intellect and some degree of curiosity for staying abreast of the latest developments in their own field, but also in others. Even more important, however, is an interest in the students and something that is shamefully neglected: didactics or less formally said, a mode of teaching designed to engage students in the learning process. To maintain a liveliness of spirit, teachers should be knowledgeable on the fundamentals of and the latest developments in their discipline. But they do not have to be actively engaged in doing cutting-edge research themselves. This is anyway an unrealistic demand that can only be met by a small percentage of today's teachers. In that sense our demand only calls the current reality by name. The reason this open secret is not addressed is that calling for an increased focus on teaching is extremely unpopular. The same people that howl that academic teaching is endangered by any infringement on faculty research, strangely enough never call for training in didactics or other forms of preparation that would directly benefit the quality of teaching!

There is no reason to think that cutting-edge research prepares scholars for rethinking the epistemological foundations of their discipline. But it is exactly this rethinking that is of great importance in making for good teaching. Advanced research today is very far removed from the foundations of a discipline, which form the basis of undergraduate teaching. Unfortunately studying the foundations epistemologically is not typically part of undergraduate curricula since few academics deal with these in their day-to-day work. Learning and doing research on the technically highest level at the frontiers of knowledge is the main focus of graduate education in the natural

as admission was in fact limited to the most gifted youth, or less than 1% of the annual cohort.

sciences as well as in the social sciences or the humanities. If teaching were placed at the core of professors' professional obligations, this clear focus on teaching would allow for a different kind of undergraduate education that does not simply mirror faculty research interests but engages the foundational, epistemological questions.

There is historic precedent illustrating the idea that excellence in research does not equate with excellence in teaching; as mentioned earlier, the Sputnik-shock set off the creation of a whole host of new teaching programs. Soon it had to be acknowledged, however, that many of the leading scientists at the time, who worked on creating these new programs, were incapable of rethinking the foundations of their discipline for teaching purposes. They simply had not been trained to take on such a task. Therefore, good teaching and good research should be treated as two sides of the same coin, though this does not mean that all professors should divide their time between both in equal measure.

Students, though, by and large care less about the latest publications than about well-prepared courses and the application of theories to local or global problems. If teachers are expected in the future to stay up-to-date in their fields and not necessarily publish themselves, they could probably handle a teaching load of 12 or even 16–18 hours a week. At first this might sound excessive. But we need to keep in mind that if the vast majority of faculty would spend more hours teaching, it is likely that the average class size and the effective student to teacher ratio would be drastically improved. From a faculty perspective this would also increase the quality of the interaction. In other words teaching would become more attractive. Secondary school teachers demonstrate that this is no unthinkable feat. Their normal teaching load is 25 lessons, or 18 regular hours. As with research, the quality of teaching should be controlled by peer-review. This would ensure the quality and the prestige of teaching and would integrate teaching faculty into a vibrant academic community striving for excellence of a different stripe.

The Future of Evaluating Academic Performance

Unfortunately and unjustifiably the question of quality in teaching is often dismissed with the question of “Who is to judge what is quality in teaching?” Yet it would be wrong to assume that it is easier to determine what is good

research than good teaching. As if promotion on the basis of peer-reviewed publications were an objective, foolproof, all-successful exercise! This is not the case. In fact the critique of peer-review as the primary means for evaluation is mounting by the day. Ultimately, we are always left with the less-than-satisfactory, yet best available choice: to rely on the judgment of a few carefully selected senior evaluators who base their decisions on empirics as well as the best of their knowledge, personal experience and judgment.

The peer-review process is currently undergoing radical change. Along with traditional and tedious evaluative procedures, there is a developing trend towards assessment on the basis of open web-based portfolios with the relevant community of “followers” and “friends” functioning as perpetual, real-time peer-review committees. Patricia Cohen (2010; see also Lamont 2009), reports that scholars—mainly in the humanities—claim “that in an era of digitalized media there is a better way to assess work. Instead of relying on a few experts selected by leading publications, they advocate using the Internet to expose scholarly thinking to the swift collective judgment of a much broader audience.” Moreover, she summarizes: “The traditional method in which independent experts evaluate a submission, often under a veil of anonymity, can take months, even years. Clubby exclusiveness, sloppy editing and fraud have all marred peer review on occasion. Anonymity can help prevent personal bias, but it can also make reviewers less accountable; exclusiveness can help ensure quality control but can also narrow the range of feedback and participants.”

The demand for good teaching to become a substantial part of the “promotion package” of a professor has up until now faced some very practical difficulties. As Hacker and Dreifus (2010, 83) comment: “Teaching reputations ... don’t travel, while research and publications do.” We would like to point out here how the meta-data generated by digital technology could make a contribution toward increased transparency.

Certainly the students should have a say too, but probably in a much more sophisticated way than by just filling out a questionnaire. It would be much easier to grapple with this problem if we knew how to “measure” what students have actually learned in a given course or outside the classroom. But this is one of the most difficult non-measurable aspects of evaluation. The usual solution of evaluating only what is easily measurable, raises more questions than it answers and very often is unfit to provide a meaningful indication of student learning. Studies on improving teaching should

therefore require experiments that investigate the merits of new methods for evaluation that lead to a better understanding of qualitative teaching outcomes.⁷⁹

From Bulimic Learning to the Conveyance of Skills and a Worldview

We have criticized the value of standard forms of assessment, since the non-measurable characteristics, such as degree of curiosity or scholarly temper, are at least as important as grades, if not more so. The problem is that non-measurable forms of assessment presuppose a much more intimate acquaintance with the student than is usually possible in the context of mass universities. In the vast literature on assessment, William E. Sedlacek (2004) offers an alternative evaluative scheme in “Beyond the Test—Non-cognitive Assessment in Higher Education.” He lists eight non-cognitive variables that should be considered, with all eight presupposing intimate knowledge of the student. These are: a) positive self-concept; b) realistic self-appraisal; c) successfully handling the system; d) preference for long-term goals; e) availability of strong support person; f) leadership experience; g) community involvement; h) knowledge acquired in a field.

It is generally accepted that the most important task of evaluation is to get a thorough picture of what the student has learned or what capabilities he or she has acquired: the learning outcomes. If we could “measure” with some precision what it is that students learned in three or four years of study, the problems listed above could be solved with greater ease. The problem is that we do not know how to measure what the undergraduate years really give to young people. The literature on assessment is enormous, yet there are no definitive conclusions. As admitted by Susan Johnson (2010), in a report for the Association of Governing Boards of Universities and Colleges, most of the Boards, whose critical responsibility is to oversee the educational quality of their institution, that is to understand the learning outcomes their institution produces, do not understand how student learning is assessed.

⁷⁹ We might also add that long-serving professors might not be in the best position to determine what students today should be learning. Intimate awareness of how students communicate and work today seems to be a much more important qualification for the position of “vice-president for teaching” than a long list of publications.

Similarly, the European University Association (EUA 2009) published a study analyzing the implementation of quality assurance (QA) processes within European universities, aiming at developing a “quality culture” within higher education institutions. The fact that this topic preoccupies university administrations in the United States and in Europe is in itself a positive trend.⁸⁰

To address the quality problem of teaching, we will need to develop rigorous discipline-based introductory classes, taught alongside seminars examining interesting, real-life situations, which will be interdisciplinary and intellectually challenging to both students and professors. The number of lectures should be radically reduced and replaced in part through independent learning and projects with new teaching formats working in small groups (either of students with professors, or peer-to-peer student groups with some guidance). A focus should be placed on discussing the information the students acquired autonomously and helping them to turn it into knowledge. The pressure to publish in peer-reviewed journals should be alleviated and cutting-edge research left to expert faculty. This would improve the student-faculty ratio and would thus allow for closer interaction of faculty and students.

This emphasis on personal interaction in small-groups—whether by students and faculty or peer-to-peer—when combined with student engagement of real-world problems will enable students to gain a better understanding of the significance of what they are learning. At the same time it would reveal the limitations not only of their own knowledge but of science and academia as well. Both teachers and students will also gain a better understanding of students’ temperaments, abilities and weaknesses. Thus the new curriculum will not only convey the principles of the New Enlightenment, it will also help us to better understand our students, as well as the effectiveness of higher education more generally.

⁸⁰ One of the strongest statements on our inability to assess what students actually learn that does not stop at mocking our inability to measure student learning, but makes serious suggestions as to how to define quality learning, is Arum and Roksa, 2011. See also the Lumina Foundation’s work in this area: http://www.luminafoundation.org/publications/The_Degree_Qualifications_Profile.pdf (Lumina, the Degree of Qualifications Profile).

Tenure and the Relevance of Teaching

Different though at the same time related to the above topics is the question of tenure, or appointments for life. Many op-eds of the leading journals dedicated to research and/or to higher education, today read like obituaries of the tenure system. The pros and cons of tenure are more complex than often presented. The supporters claim that only the tenure system safeguards the principle of academic freedom, and prevents the encroachment of the market logic that allows undue interference of corporations, governments, donors or university administrators. The detractors criticize tenure as an abuse of the concept of academic freedom that artificially creates a privileged elite, accountable to no one.

From our point of view, what is most important is that there is differentiation and yet that, at a basic level, there is an equal treatment of professors of all stripes. Differences should be merit-based in recognition of achievements in one's specific domain—whatever it may be. Basic contracts for teaching and research faculty should be identical since the transfer of knowledge is just as important as its creation. Excellence in teaching should become an important criterion in the hiring process. If the tenure system is to be continued, it should apply to teaching and research faculty alike (Clawson 2009).

If the tenure system is maintained, the shift to digital scholarship and teaching may prove to be a window of opportunity. Going digital challenges traditional procedures and thus may help in leveling the playing field when it comes to assessing their respective importance in tenure decisions. Laura Mandell (2009) points out that “for the past 50 years, what people have done on promotion and tenure committees is to say ‘OK, this was accepted by Cambridge University Press. I don’t need to read it because I know it’s quality.’” As scholarship moves online, traditional university presses lose their gatekeeper function. Tenure committees therefore may have to find new ways to assess someone’s contribution in the absence of established brand names. Moreover there is another challenge to standard procedure: digital scholarship often produces some form of open educational resource. The interaction in online courses can yield research results. Whether such work falls in the “teaching” or in the “research” category, when it comes to evaluating a candidate, often is far from clear, helping to blur the clear-cut distinction between research and teaching. Online teaching in combination with the

fact that English has become the global *Lingua Franca* in academia and science, may make teaching reputations as mobile as research reputations. Suffice it to say that we are hopeful that this development may help to increase the relevance of teaching for tenure-track positions as well as the general social prestige of teaching appointments.

Rankings

Belonging to the same cluster of topics is the vexing issue of rankings. International rankings of universities have become a fashionable, maddening exercise, with each ranking organization considering different, arbitrary parameters and (except for the very top) reaching widely differing results.

It seems obvious that apart from the top ten institutions in the world, rankings are essentially not much more than a gloried guessing game. Most professors would be at a loss to even estimate the quality of what is being done at their own institution outside of their department. To us they seem ill-placed to evaluate institutions they are often only familiar with by name.

At this point one could simply dismiss rankings as intellectual fraud, but these rankings have gained considerable attention in recent years and are being used, against better knowledge, by universities for the purpose of brand building, often supporting university efforts to attract fee-paying students as well as philanthropic and government grants and subsidies.

In short: it appears as if what rankings are measuring is not academic quality, but an odd mix of statistical noise and fleeting sentiment. In using them on their websites, universities betray what lies at the heart of their educational mission: their commitment to critical thinking. The only use they should have for them is to use them as bad-practice case studies in introductory courses on the scientific method.

Now, one could simply laugh about this type of intellectual window dressing, were it not for the fact that its misleading judgments are still taken seriously all too often. Some rankings like the Academic Ranking of World Universities (ARWU)—commonly known as the Jiao Tong or Shanghai ranking—and the SCImago World Report use more reliable data and are therefore more consistent, but this does not make them any more valid as measures of academic quality. These rankings may accurately measure something, but that something has little to do with actual quality in terms of research and teaching.

Perhaps the most intriguing new effort to develop a sensitive, more varied, and substantially more user-friendly rankings system is U-multirank⁸¹ generated by the European Commission. Here the effort is to develop a new multi-dimensional global university ranking system that could be used both to evaluate universities around the world and to allow individual universities to define who they are and then to assess themselves on the basis of their own goals. Whether this will actually lead to greater diversification of universities and major reforms within individual universities remains to be seen. The very complexity of the resulting U-multirank system is its strength as well as its weakness. Many institutions fail to provide the necessary data and hence do not show up. This in combination with its multidimensional non-reductionist approach explains why U-multirank has not yet and probably will not make the headlines.

Are rankings and ratings just another foolish attempt to measure the non-measurable? The answer is: yes and no. Rankings will always capture only part of reality. But they can also create transparency, accountability and provide a framework within which healthy competition can unfold. Ultimately, these are the very principles academia is based upon at the individual level.

There clearly is a demand for this type of information from a whole host of stakeholders, ranging from policy makers to students. Maybe we do need a sort of university stock market, where analysts sieve through aggregated, reliable information and the rank/value of institutions provides a relevant signal in an increasingly complex world. One thing is certain: rankings will not go away. As Philipp G. Altbach (2011) states: "If ranking did not exist, someone would invent them. They are an inevitable result of mass higher education and of competition and commercialization in postsecondary education worldwide. The question is whether they will be bogus numbers fabricated by newspaper companies out of commercial interest, or official instruments, subject to public scrutiny? Ideally there should be a lively public debate about all ranking criteria and their relative importance so that ultimately the ranking is an as-adequate-as-possible representation of what academic quality is to that society."

As pragmatists we assume that trying to do something, and then improving it incrementally, is better than the fatalist assumption that even arbitrariness

⁸¹ See <http://www.umultirank.org>.

is preferable to well-intentioned, yet imperfect policy. Simply dismissing rankings is a kind of intellectual arrogance that we cannot afford. Much like in politics—where those that sense themselves too smart for it have to live with the fact that they are governed by people whom they deign to be more ignorant than themselves—academics should rise to the challenge of providing society with adequate information about their performance. Investigating such questions would also be an important task for a new discipline of Research in Higher Education that we feel is so sorely lacking.

One last analogy should be considered in this context: university rankings are a comparatively recent phenomenon and so far little serious thought has gone into devising rankings that are worth taking seriously. Many technological and organizational innovations looked very humble when they were first conceived of. It took humanity a hundred years to get from the Wright brothers to the International Space Station. Seen from this perspective devising university rankings that will adequately approximate academic quality in scholarship and teaching according to a number of standards of measurement does not seem to be an insurmountable task.

CHAPTER 8

DEMOCRACY AND THE PHILOSOPHY OF EDUCATION

Globalization has unified the world. It has led to interconnected markets and a global digital information infrastructure. At the same time cultures, religions, and languages have become strongly cultivated locally. In the context of higher education, it is an unfortunate development that university curricula have become globalized: instead of studying the local context and translating it into different curricula, most universities in the world simply copy the conventional Western curricula.

This being said, one positive development of globalization over the past three decades has been an increased acceptance of democratic values in many parts of the world. Clear evidence for this is the fact that even oppressive regimes today feel the need to at least fake “free” elections. In the current state of rising terrorism it may seem counter-intuitive to suggest that democratic values are more widely held than in the past, but as Wole Soyinka has argued, the recognition that “humans have rights” has become universally accepted, greatly impacting even those places where this principle is routinely violated. Soyinka reminds us that “[t]he message, whether from Yoruban elders or the Founding Fathers, the Bible or the Koran, is the same: humans have rights ...” (Soyinka 1999; see also Risse et al. 1999). And yet, our understanding of universal human rights is not the same as that conceived by the Founding Fathers of the United States or the leaders of the French Revolution. The advocates of democracy do not speak today of God-given (which was always a euphemism for Western-dictated) rights. Human rights and the value of democracy are fundamental truths, accepted, we might say, not only by an overwhelming majority of human beings, but by humanity at large. This acceptance was attained through what is termed “negotiated universalism.” It is today not guaranteed, but it is dominant.

In the globalized world, more and more people may be growing up in a culture of shared histories, but they also experience having multiple identities, multiple loyalties, and multiple, often contradictory, value systems. Avoiding conflict among human beings, however, is not the same as conflict avoidance within an individual. While it is usually a valid and important aim to minimize conflict between groups of people, it is not at all self-evident that it is a worthwhile cause to attempt to eliminate or gloss over differences within individuals in order to avoid conflict: instead we should attempt to come to grips with conflictual situations, beliefs and identities by developing and cultivating a dialectical mode of thinking. Yet, under the influence of modern science—which is strictly anti-dialectical—we tend not to think dialectically and pay a heavy price for it.

Before getting into the problems of educating for democracy, however, let us remember how much democracy itself has changed. The Israeli political scientist Yaron Ezrahi opens his book, *Necessary Political Fictions* (2012) with the following statement:

Contemporary democracy is not the deliberative self-governing polity of informed free citizens envisaged by modern enlightenment thinkers. It is a system of government where public policy consists of an eclectic patchwork of half-baked programs, where politicians tend to posture rather than act, where the public sphere is more a site of shifting amorphous moods than a clash of ideas.

Later he asks:

Can democracy as a form of political order survive recent radical changes in the modes and contents of the democratic political imagination? Can the vision of liberal democracy as a bottom up regime constituted by the free association of autonomous individuals be sustained despite the erosion of its enlightenment foundations? Can liberal democracy regenerate itself on a new cultural basis, in the absence of earlier constitutive beliefs in the certainty and solidity of an external world of accessible facts and the stability of individual and communal identities?

Every young person should confront these questions and their implications in the framework of his or her college education. It would be useful to consider the developments of contemporary democracy as a real-life challenge and to spur students on to address the question as to what contemporary democracy

should look like. Perhaps one could establish a course investigating this question, for example on the basis of two short texts: Shmuel N. Eisenstadt's *Paradoxes of Democracy* (1999) and Ralf Dahrendorf's *Die Krisen der Demokratie* (2003; English translation: *The Crisis of Democracy*, 2007). Interestingly both Eisenstadt and Dahrendorf quote Karl Popper's seemingly very simple definition that a democratic state "has to be constituted so that bad rulers can be got rid of without bloodshed, without violence" (quoted in Shearer and Turner 2008). Eisenstadt also points out how close Popper's definition is to the approach of Joseph Schumpeter (1974). Such an introductory course should ideally be accompanied by a seminar in political theory.

It has been for many years now one of the aims of higher education (especially in the United States but also indirectly in Germany) to educate young people in the spirit of democracy. There is no unanimous agreement on how to do it, but there is a great deal of thoughtful literature on the topic. We will refer to several existing works to illustrate how certain developments have not received enough attention in the present debate.

In order to be able to participate in a democratic civil society in the 21st century, concerned citizens should be consciously aware of the main problems that preoccupy humankind. Due to the inherently complex and non-linear nature of many of these problems, civic or moral education for democracy today has a strong cognitive dimension, which cannot be relegated to extracurricular activities or marginal courses that "preach" democratic values. Today's multitudes of students hail from diverse religious, ethnic and social backgrounds. In order for them to understand and act according to universal human rights and duties, their political education needs to be based on a general understanding of this complex and messy world and an awareness of the fact that its enormous problems vary from context to context. This type of education thus is imperative in all types of institutions: in Germany, at the Fachhochschulen as well as the Universitäten; in the US, at the community colleges, liberal arts colleges and universities.

Some Preliminary Theoretical Considerations

The classic source for discussing this topic is John Dewey's (1916) *Democracy and Education* even though he does not specifically deal with higher education. Quite simply, for Dewey education was an important means for

protecting and strengthening democracy. Dewey's core thesis that all young people have a right to education for the sake of personal development fortunately has become universally accepted over the course of the last century. Even when it is still far from a daily reality for many people around the world, Dewey's ideas have become universal aspirations (Colby et al. 2007).

A series of books focused explicitly on higher education sponsored by The Carnegie Foundation for the Advancement of Teaching (CFAT) has contributed a great deal to the discussion of the relationship between higher education and democracy. The first of these, Ernest Boyer's *College: the Undergraduate Experience in America* (1987), complains that American institutions of higher education teach competence, but not commitment. There is a clear distinction between the desirable moral pluralism and the undesirable moral relativism, the idea that "anything goes." Moral pluralism is not equivalent to indifference but rooted in the deep conviction that there is no such thing as value-neutral education. Moreover, we are reminded that "Social conscience, compassion and commitment to the welfare of those outside one's immediate sphere, is an important component of moral and civic development that goes beyond the level of personal integrity" (Boyer 1987, 18). Most importantly, however, "there is considerable evidence that both moral and civic learning and academic learning more generally are at their most powerful when creatively combined" (Boyer 1987, 20). In the years that have passed since this book was written, the impact of globalization, the international financial crises and numerous large-scale corruption scandals, as well as the direct threats to democracy itself, have highlighted even more sharply the urgency of training future citizens of democratic societies in a way that allows them to understand the world's major problems on a cognitive level.

In fact, the political maturity of citizens has become of supreme importance for the governability of modern liberal democracies. The degree of partisanship in American politics has reached a point that endangers the governability of the country. The public demonstrations and the restlessness in many European countries such as Germany, France, and Great Britain show that the formal education of those who go into public administration—thinking that they can rely exclusively on the authority that has been bestowed upon them qua office without careful consideration of public opinion—is severely deficient. Examples of violent and non-violent revolutions on behalf of

democracy that quickly deregulate into chaos, dictatorships, elections that are hardly free at all are too numerous to mention.

Educating Citizens (Colby et al. 2003) and *Education for Democracy* (Colby et al. 2007) describe how an understanding of higher education as learning civic responsibility is still rhetorically appreciated but no longer has an important role to play in curricula. The present consumer mentality of parents and students (to which universities as increasingly market-oriented institutions very often tend to succumb), the financial cutbacks which created the so-called “audit culture” and the unprecedented competition for prestige as measured by publications and research grants have all come to marginalize civic education. Political learning that supports engaged citizenship in a pluralist democracy does not fall neatly into the boundaries of any one discipline and it clearly has to complement—if not to replace—the objective, often mathematically driven study of political institutions and behavior. On the other hand—and this is the important insight—the trend toward cultural diversity has simultaneously forced moral and civic concerns to the forefront: “the movement toward incorporating a focus on cultural diversity, has grown quickly, creating new impetus for engagement with moral and civic questions” (Galnoor 2009).⁸²

A New Agenda for Higher Education (Sullivan and Rosin 2008) calls for training undergraduates’ capacity for practical reasoning. Deeply rooted in the work of John Dewey, especially his classic studies, *Democracy and Education* (1916) and *The Quest for Certainty: A Study of the Relation of Knowledge and Action* (1929; 1988), shows the intimate connection between training for practical reasoning and educating for democracy. Only by “moving back and forth between specific events and the general ideas and common traditions that might illuminate them” (Sullivan and Rosin 2008, xvii) can we hope to draw lessons from theoretical social sciences (like political science and related disciplines) for democratic behavior. An “integrated social science” curriculum must include education for democracy as an integral part.

⁸² We should add how important it is to distance ourselves from simplistic politicized education, which indeed has no place on campus, while retaining a strong normative conception of citizenship.

The Role of the State

Achieving desirable policy outcomes in the salient areas that lie at the heart of political discourse today requires the collaboration—even the co-production—of the citizenry. Politicians cannot rely on hierarchical enforcement to implement their ideas in fields such as health, environment, social or education policy. They have to rely on the insight of autonomous citizens who need to understand why they have to accept certain regulation or why they should behave a certain way. This understanding is rooted in a certain cognitive capacity as well as a capacity to pass an educated judgment. The further development of these capacities is what we conceive of as one of the foremost tasks of higher education, one that is crucial for the continued functioning of our liberal democratic polities.

In India where many new universities have been established, the media are full of articles reminding the country that literacy is a basic prerequisite for having a democratic society; this is unquestionably true, although it is worth remembering that India's democracy is maintained also by many millions of illiterate citizens (Agarwal 2009). What is very rarely mentioned, however, is that the university, and especially undergraduate education, is as important as literacy for maintaining a functioning democratic society in the 21st century. Leon Botstein (2015) in an essay on education and democracy is right to warn: "... the fact that the quality of political discourse has declined over the very decades in our recent past that have witnessed the erosion of confidence in progressive pedagogy should inspire us, as a society ... public education is about educating the future citizen to consider a common ground in politics that can and will secure a more rewarding notion of personal security and tranquility for all."

In his book *Multiversities, Ideas and Democracy* George Fallis (2007; see also Fallis 2014) makes that very point by explaining how in the 21st century the university as an institution has actually become essential to the functioning of democracy—a fact that does not appear to have become part of public perception.

When Immanuel Kant and Wilhelm von Humboldt demanded the support of the government and yet independence from it, they were subjects living under a hereditary monarchy and not in a democratically elected constitutional state. Today, to demand autonomy from democratic governments with constitutions written at least in the name of the people may

sound paradoxical. But there are still enough good reasons for limiting too much direct governmental influence.

After WWII the responsibilities of governments expanded in all liberal democracies. “Welfare states” were established in Europe, and the state was responsible for guaranteeing the civil, political, and social dimensions of citizenship. Drawing upon a classic essay by Thomas H. Marshall (1963), entitled “Citizenship and Social Class,” Fallis argues that social citizenship requires the state to provide education for its citizens: “... civil and political rights are designed for reasonable and intelligent persons, and therefore education is a necessary prerequisite to civil and political freedom ... each component of the bundle which is the university—undergraduate education, the professional schools, graduate education and research—has a crucial role in the liberal democracy of post-industrial society” (Fallis 2007, 42). This is very close to the positions presented in this book.

But if government is responsible for educating its citizens, it must then have the tools to control whether the institutions in charge of education, including higher education, do in fact put public funds to good use. Yet on the other hand universities do have the right to insist that it is their historical right and privilege to define what higher education should be. It is important that this is clearly defined and regulated to avoid the improper shifting of responsibilities.

We must also realize on the cognitive level that “educational theory is at the same time political theory” and we must concern ourselves with two questions: “What kind of person do we seek to create through education?” and “What sort of citizens do we want?” (Fallis 2007, 44) Even if this sounds like social engineering, we believe it is important to address these questions in light of the enormous influence wielded by public education.

We want to return to John Dewey who, like no other, wrote as intelligently about education and democracy: “Unless education has some frame of reference it is bound to be aimless, lacking a unified objective. The necessity for a frame of reference must be admitted. There exists in this century such a unified frame. It is called democracy” (Dewey 1944, 86).⁸³

⁸³ We recommend an essay by Gert-Rüdiger Wegmarshaus (2007), entitled “John Dewey’s Understanding of Democracy: Way of Life—Pooled Experience—Learning Process,” as an excellent basis for taking Dewey’s views into account when developing a course or courses on democratic education.

Towards a Philosophy of Higher Education

It is not accidental that studies on democracy and education are conceived of as studies in philosophy. Finding an answer to the question “What kind of undergraduate education is suitable for the cultivation of democratic citizenship?” is indeed a philosophical issue. Hence, we would like to raise the question “Is there a philosophy of education?”

The closest intellectual relative to a philosophy of education is the philosophy of science. Many of the classical topics in the philosophy of science are directly relevant for the principles of constructing a curriculum and therefore for a philosophy of education.

A central tenet of our principles for an undergraduate curriculum is the call for a fusion of theory and practice. The related topic in the philosophy of science is the discussion on how all facts are theory-laden, to the same extent that all theories are fact-rooted. What is fact and what is theory are contextual questions. A fact cannot be understood without a theory and a theory has meaning through a reference to facts only. Nelson Goodman (1978, 97) explained this succinctly by stating, “facts are small theories, and true theories are big facts.”⁸⁴ One of the consequences of this for educational practice is that in the dialogue with students one should encourage them to bring out what they think about a question, irrespective of the accuracy or inaccuracy of their views. If a person begins to understand a question, he or she already has some kind of possible answer in mind.

On the Meaning of Practical Reason

Our view of what a philosophy of education in the 21st century has its roots in the philosophy of the American Pragmatists—and above all of William James—which in our opinion could and should become the basis of the New Enlightenment in university education. In addition to discussing James, we want to point to the contemporary work of Hilary Putnam and Stephen Toulmin as guides in our exploration of pragmatism.

⁸⁴ Even though this book is not a treatise on the philosophy of science, we would like to recommend Ludwik Fleck’s *The Genesis and Development of a Scientific Fact* (1979).

In his short book, *Pragmatism*, Hilary Putnam (1995) affirms William James' rejection of dualisms of all kinds, arguing that facts, values, theories (and/or interpretation) are "interpenetrating and interdependent" (Putnam 1995, xii). If this were applied to curricula and the way disciplines are being taught, we would witness a major revolution!

Putnam (1995, 14-18) formulates 6 principles of pragmatism:

- 1) knowledge of facts presupposes knowledge of theories;
- 2) knowledge of theories presupposes knowledge of facts;
- 3) knowledge of facts presupposes knowledge of values;
- 4) knowledge of values presupposes knowledge of facts;
- 5) knowledge of facts presupposes knowledge of interpretations;
- 6) knowledge of interpretations presupposes knowledge of facts.

While Putnam mentions that some of these principles are generally no longer controversial in philosophy, they remain distinctly controversial elsewhere. Much will have to change before these principles become recognized in the philosophy of science, let alone, for them to become fundamental principles that guide university teaching.

Putnam argues that the coherence of theories is value-based. We expect our theories to be explanatory rather than just predictive; to decide, however, what is a coherent explanation is a value judgment. For "explanatory" ultimately means that it is satisfactory to oneself, and thus individuals will differ in their assessments. As James puts it, "To a certain degree, therefore, everything here is plastic." Furthermore, James says, "I, for my part, cannot escape the consideration, forced upon me at every turn, that the knower is not simply a mirror floating with no foothold anywhere, and passively reflecting an order that he comes upon and finds simply existing. The knower is an actor, and coefficient of the truth on one side, while on the other he registers the truth which he helps to create" (quoted in Putnam 1995, 16-17).

Yet again it is important to note that the plasticity referred to here is not an "anything goes" type of relativism, but a complex interaction between the environment and the mind of the individual laden with values and interpretations. The claim that we "register what we help to create" distances pragmatism from skepticism. In Putnam's view, "that one can be both fallibilistic, that is, understanding that one cannot be absolutely certain, and antisceptical is perhaps the basic insight of American pragmatism" (Putnam 1995, 21).

An additional aspect of pragmatism—one that it shares in the final account with the philosophy of Kant—is the primacy of practical reason. The term “pragmatism” was introduced by Charles Peirce in 1878 in his important essay “How to Make Our Ideas Clear” (Pierce 1878). It derives from the Greek word “pragma” which means action.⁸⁵ James described pragmatism as follows: “A pragmatist turns his back resolutely and once and for all upon a lot of inveterate habits dear to professional philosophers. He turns away from abstraction and insufficiency, from verbal solutions, from bad a priori reasons, from fixed principles, closed systems, and pretended absolutes and origins. He turns toward concreteness and adequacy, towards facts, towards action, and towards power. This means the empiricist temper regnant, and the rationalist temper sincerely given up.” James continues: “At the same time it does not stand for any special results. It is a method only” (James 1995 ed., 21).

Possibly the most fruitful statement of what James means by empiricism and rationalism is: “What do the terms empiricism and rationalism mean? Reduced to their most pregnant difference, empiricism means the habit of explaining wholes by parts, and rationalism means the habit of explaining parts by wholes” (James 2009 ed., 3; originally published in 1909). Clearly in rigorous, technically advanced introductory science courses we are used to explaining parts by wholes (albeit, presupposing that the whole is equal to the sum of its parts); we expound a broad, universal theory and then try to explain “the parts” by it. This is why for example the *homo oeconomicus* has no resemblance to any living human being. The pragmatist way of teaching would be the other way round asking the question: But what are the “parts”?

It is easy to understand the enormous impact these views and approaches would have on the way we teach the sciences—natural as well as social. Instead of passing on an endless series of unalterable and universal truths to the students, this approach would stress that all ideas have to be understood

⁸⁵ Robert D. Richardson (2006), in his excellent biography of William James, mentions Goethe’s influence on James and describes the Faustian evolution of thought with “In the beginning was the word” as in the opening of the Gospel according to John, to “In the beginning was the mind (Sinn),” to “In the beginning was the power (kraft)” and finally to “In the beginning was the act” (act, in German *Tat*, in Greek *pragma*). Later Peirce wanted to distance himself from the pragmatism of James and suggested calling his direction in thought *pragmaticism*, an invented word that he proclaimed was so ugly no one would want to take it from him.

in their context and checked for their validity in practice. It openly admits our scientific theories are fallible; that interpretations and values are always involved in the judgments that make up our theoretical thinking. It shows the interpenetration of facts, values and theories. Putnam prefers “interpenetration” to “holistic interdependence” in order to “... emphasize that the interdependence of which I speak is not an interdependence of elements which can always be distinguished, even notionally” (Putnam 1995, 57).

In order to appreciate what James means when he discusses the value-laden debates as to what is explanatory and what is not, and what is coherent and what is not, we must consider the way new ideas are being introduced into an existing body of knowledge. Instead of Kuhnian revolutions in thinking, or Gestalt switches in our perceptions, new opinions and new truths are grafted on previously existing and accepted truths (Kuhn, 1962). To quote William James once again: “New truth is always a go-between, a smoother-over of transitions. It marries old opinion to new fact so as ever to show a minimum of jolt, a maximum of continuity. We hold a theory true just in proportion to its success in solving this ‘problem of maxima and minima.’ But success in solving this problem is eminently a matter of approximation. We say this theory solves it on the whole more satisfactorily to ourselves, and individuals will emphasize their points of satisfaction differently” (James 1995 ed., 24).

This is essentially another formulation of what has been called “concepts in flux.”⁸⁶ It is of great value for deepening the understanding of any discipline if the students are exposed to the way the theory under discussion emerged, was developed and has changed over time. Much is lost the way we usually teach scientific theories as if they had fallen from the heavens in their final and complete form.

Since our generation is still somewhat enamored with the 19th-century ideal of the lone genius, it is rarely mentioned that the creation of knowledge

⁸⁶ Yehuda Elkana introduced the idea of “concepts in flux” in 1970, referring to the fact that a new idea, whether as a new theory or new form or even a new definition, brings with it a question: Will the new fact or theory be described in the form of new thinking or of old thinking? Obviously, before a new theory is thought through and re-organized, a situation occurs in which both the old and the new are mixed together. At this time then the new theory cannot be clearly presented. It takes some time before a clear formulation of theory is attained, a formulation that is consistent and that refers completely to new knowledge. For more on this, see Elkana (1970). Mara Beller used this concept in a productive way in her book, *Quantum Dialogues* (1999).

today typically is the result of group activity or at least of corresponding individuals.⁸⁷ The moment we begin to consider the fact that knowledge creation almost always is a collaborative process, we will find ourselves deep in a scholarly area, which has become ever richer in the last thirty to forty years and which goes under several competing labels: “social studies of science,” “science, technology and society,” “sociology of knowledge” and many others. Whatever the name, the impact of knowledge produced in these disciplines should be reflected in university curricula.

Indeed, Peirce, James and Dewey saw the production of knowledge as a result of “... a cooperative human interaction with the environment; and both aspects, the active intervention, the active manipulation of the environment, and the cooperation with other human beings, are vital” (Putnam 1995, 70). This cooperative activity, according to Peirce, was the active pursuit of falsifying experiences. As Putnam describes it, “Ideas must be put under strain, if they are to prove their worth” (Putnam 1995, 70).

In order to reform curricula and teaching in higher education, we need to appropriate another of James’s contentions: “It is far too little recognized how entirely the intellect is built up of practical interests” (James 1882, 58–59). Practical interests, strong reliance on facts (“stubborn, irreducible facts”) is the key to unlocking the curiosity of students in the material taught to them. Our mental life is chaotic and elusive, and “cognition is incomplete until discharged in act” (ibid.).

Stephen Toulmin’s approach is somewhat different. In his book, *Cosmopolis* (Toulmin 1990), he argues the standard story that the great scientific innovations of the late 17th and 18th centuries were the result of a happy, peaceful period of flourishing creativity is all wrong; rather it was a period of religious fanaticism, extreme economic crises and violent warfare. He sees a causal connection between the emerging rationalism, Cartesian systematic doubt and all those positivistic values, which we have called here the cluster of values of the Enlightenment. In Toulmin’s opinion, open-ended, flexible, context-dependent, reasonable (not rational) ways of thinking were typical of the Renaissance and especially of the 16th century—that is, the century of Montaigne.⁸⁸

⁸⁷ The Nobel Prize contributes to a great degree to maintaining this myth, even when the prize is more and more often awarded to two or three scientists in one category.

⁸⁸ Montaigne is a critical figure for Toulmin, as well as for us. “Montaigne’s century” also includes Rabelais, Shakespeare, Bacon, and many other intellectual heavyweights of that time period.

In Toulmin's view, the New Enlightenment reigned hundreds of years before the conventional Enlightenment. Toulmin goes further back than Descartes, back as far as Plato, and criticizes, together with Dewey, Wittgenstein, Heidegger, Rorty and others, the "theory-centered style of philosophizing—that is one that poses problems, and seeks solutions, stated in timeless, universal terms—and it was just that philosophical style, whose charms were linked to the quest for certainty, that defined the agenda of 'modern' philosophy from 1650" (Toulmin 1995, 11). And we add that from the 19th century on, as the research university marched forward in conquering glory, this very same theory-centered, "modern" quest for certainty characterized university education, and especially undergraduate curricula. Descartes delegitimized culture and tradition (and Toulmin wisely reminds us that for Descartes, tradition was not distinguished from superstition) and as a consequence rationality reigned supreme. And, indeed, the critique of modernity in the last twenty to forty years has often amounted to a critique of rationality itself.

Another way to formulate these changes would be to say that while the age of the scientific revolution—or the age of rationalism—sought to de-contextualize knowledge, the task of philosophy (for Toulmin), and of curricular reform (for us), is to re-contextualize knowledge. In the Europe of the 16th century, as in classical Athens, some scholars condemned as irrational "confusion" what others welcomed as intellectual "profusion." Yet, for the Renaissance, rhetoric and logic were complimentary disciplines. It was Descartes and his followers who eliminated rhetoric from the status of a respectable intellectual pursuit: only logic remained. We believe that the two—rhetoric and logic—must again gain equal standing.⁸⁹

Cultivating Intellectual Diversity

The creation of enormous amounts of knowledge, in all probability, was made possible only by the program of the Enlightenment with its quest for certainty

⁸⁹ The logic vs. rhetoric debate goes back to great antiquity. "Logos" was even then understood in two senses: the tradition that privileged the rational, and the tradition that emphasized speech, persuasion, and the like. Much of the venom that Plato poured on the Sophists had to do with his insistence that only the purely rational interpretation of logos is philosophically relevant. In our opinion this debate provides the starting point for the introduction of rhetoric into undergraduate curricula. See Kimball (1995).

and universal, context-independent theories. Yet, we believe that the dogmatic pursuit of this program has exhausted itself and now is the time to cultivate intellectual diversity, not in the form of a Baroque garden but in the shape of a wild meadow of flowers.

As a basic guideline for curriculum reform, or for that matter our educational philosophy, we can take the characteristics of the rationalistic period from ca. 1650–1950, and, as Toulmin (1990, 31–34) described it, turn them around: “formal logic was in, rhetoric was out ... general principles were in, particular cases were out ... abstract axioms were in, concrete diversity was out ... the permanent was in, the transitory was out ...”

Bruce Kimball (1995) argues that belief and meaning, even truth itself, are fallible and reversible, and that an experimental methodology of inquiry can be applied in all academic fields and in reflexive thinking. Belief and meaning, and truth, depend on the context and the intersubjective judgment of the community in which they are formed. Experience is the dynamic interaction of the organism and its environment, resulting in a close interrelationship between thought and action. The purpose of resolving doubts or solving problems is intrinsic to all thought and inquiry. And all inquiry and thought are evaluative, and judgments about fact are no different from judgments about values. This shows that we do not stand alone in our understanding of knowledge and our intentions.

We began this chapter by asking whether there is a philosophy of education and whether the philosophical tradition can be drawn on for our present purposes. For us, this question is easy to answer. Pragmatism is the philosophy of education. Its approach to knowledge can be imparted to students through confronting them with real-life situations. Rather than simply preaching the values of a democratic society to students, such learning experiences are suitable ways of inspiring students to negotiate compromise in the face of complex challenges, avoiding supposedly “simple solutions.” Collaboration on concrete projects is a way to offer them the opportunity of actively experiencing what these values mean in practice.

Under what name do we term this concept of education, incorporating global contextualism as well as the values of engaged citizenship? Our suggestion: pragmatic humanism.

CHAPTER 9

DOCTORAL EDUCATION

This book is dedicated to an educational philosophy as the basis of a radically revised undergraduate curriculum. Yet, what happens after the first degree, whether the BA or the BSc, is also highly relevant for a student's undergraduate years. Undergraduate and graduate studies cannot be decoupled, nor should they be.

The rethinking of the doctorate has been going on for a long time. However, even this process usually concentrates on one discipline, or sometimes, in more adventurous universities where the department structure has been (at least partially) abolished, on the level of one school, or, alternatively as a "generic activity at the all university level" (Schulman in the preface to Walker et al. 2008; see also Golde and Walker 2006).

In a survey by Maresi Nerad (2004), "The Ph.D. in the US: Criticisms, Facts, and Remedies," the author presents the main criticisms of the internationally admired American PhD, and the various initiatives for change, each addressing a different aspect of the criticism. The criticisms she lists are, in a somewhat shortened version, the following: the training is too narrow; professional qualifications like teamwork and organizational skills are lacking; no preparation for teaching; it takes too long; the student's experience is limited to academia. What can be done to address these problems?

Certainly, doctoral programs all over the globe should aim not only at educating academics specialized in their disciplines but also practitioners infused with a scientific ethos, whose profound intellectual preparation enables them to become effective agents of change beyond the university gates. Too little attention is being paid to the widely spread arrogance of science and scientists. The doctoral years should be the ideal time for imbuing future scholars and scientists with due modesty. Ethical training has a powerful

influence on how scholarship is carried out, both in theory and in practice. Human nature is much more complex and messy than rational approaches and models would make us believe. Incorporating this reality into undergraduate and doctoral education will be a momentous challenge.

The Carnegie Initiative on the Doctorate

In the mid-2000s the Carnegie Foundation for the Advancement of Teaching initiated the Carnegie Initiative on the Doctorate (CID), dedicated to “Rethinking Doctoral Education for the 21st Century.” It featured comparative studies across the “learned professions”: law, engineering, the clergy, teaching, medicine and nursing.⁹⁰ Two companion volumes appeared entitled *The Formation of Scholars* (Walker et al. 2008) and *Envisioning the Future of Doctoral Education—Preparing Stewards of the Discipline* (Golde and Walker 2006). The studies involved 84 departments with PhD programs: chemistry, education, English, history, mathematics, and neuroscience. The analysis brought the following results: The separation between undergraduate and graduate programs is much too rigid. At the undergraduate level there is little research; if students were to tackle real-life situations starting in the first semester, they should at least in some limited form be involved in research. This does not need to entail cutting-edge research, which produces enormous costs, but rather focuses on instructing students on the basic principles of experimentation.

On the other hand, during graduate studies and writing a PhD—which is all about research—knowledge about how to conduct research is taken for granted. It just needs to be acquired. Existing methods, however, need to be reflected upon and critically examined. Yet, a real “pedagogy of research” is rarely if ever mentioned. This has remained unchanged for more than a hundred years—ever since the German research university was transplanted to the United States in the 1870s. Doctoral students, however, should deal intensively with the question of why a certain methodology is chosen and whether it is appropriate for their subject matter or argument, how the methodology can be made responsive to their work, and what they have left out in choosing their methods. Every thesis requires its own method, or

⁹⁰ See Schulman (2005b, 2010), Sullivan (2005, 2007), and Sullivan and Rosin (2008).

mixture of methods. This is why we believe that academics are best described as intellectual “bricoleurs.”

That approaches used in a given discipline are never seriously questioned is also based on structural problems. There is simply a lack of time for addressing such questions. Rather than thinking and rethinking the ways for educating scholars and conceiving a doctoral program for that purpose, professors often have other things to worry about. As Walker and colleagues (2008, 5) point out “The life of the tenured faculty member may appear to be one of privilege and intellectual reward, but many are torn by increasing and competing demands for scholarship, fund-raising, teaching and mentoring, community engagement, and family life. Their doctoral students, in turn, often feel burdened by debt, exploited as lab technicians or low-paid instructors and disillusioned by the disgruntlement of overworked faculty mentors”. They do not then spend a great deal of time pondering these questions, which might be beneficial for them as well as for society.

The topics covered by *The Formation of Scholars* (Walker et al. 2008) include “scholarly integration,” “intellectual community,” and “stewardship.” Scholarly integration emphasizes not only the need to deal in a comprehensive way with research and teaching but also with basic research and integrative and applied work. The creation of an “intellectual community” seems to us the most important of all, and also the most neglected aspect of academe. The concept of “stewardship” combines knowledge, skills, and principles, that is expertise with a moral compass.

The most original and thought-provoking message of *The Formation of Scholars* is the call for abandoning the medieval master/apprentice model of doctoral training: “... many students in many fields would greatly benefit from an alternative model of doctoral education in which apprenticeship is a shared function, and a reciprocal one, that fosters learning for both professor and student” (Walker et al. 2008, 14).

The alternative would be to create a real intellectual community. European academics report in gushing tones on just this when they return from a stay at one of the leading universities in the United States. This concept is barely understood in Europe and it is surprising as well as regretful that those returning from such experiences are only rarely successful in establishing a similar culture of intellectual curiosity and openness in Europe.

Yehuda Elkana (2006) argues that doctoral training could become a shared activity and could serve as the foundation for a genuine intellectual

community. Let us here just stress two main points: 1) Problem-choice should be a shared activity of all the professors and all the other graduate students in the department or school and should last an extended period (up to six months). Each stage would be discussed in-depth in a departmental seminar such as the intellectual need for research on this topic, the “external” constraints like cost, the availability of equipment as well as the degree of risk involved, and risk-taking should be encouraged in the limits of reasonableness, short of self-defeating choices. All the while, ample space should be left for personal interests and preferences. 2) After a problem has been chosen, and the doctoral student is deep in the midst of the research on this problem—let us say after three years (if we take into account an average of six years for completing a doctorate)—the process should be artificially stopped (not, heaven forbid, to change the topic). At this point the topic should once again be discussed in several departmental meetings in order to see how the problem, chosen three years earlier, has shifted in the discipline or research area, due to the way knowledge grows and develops. This will help free the student from the clutches of an approach that is too narrow. This is a problem of overspecialization: it typically arises after the original formulation of a problem, work in the same area continues during the post-doc period and often goes on until tenure is achieved. This is a consequence of the narrow career structure in many disciplines.⁹¹

Critical for forming a real intellectual community are the criteria used in hiring new professors. An unwritten condition for being appointed is the assessment of how far the candidate should be ready to participate in the life of a vibrant intellectual community. This requires the very personal and continuous participation of the heads of the administration in the activities of the departments, as well as in meetings with faculty and doctoral students, to foster the intellectual community.

Further, this requires a commitment to conduct collaborative work on the curriculum and to create physical spaces that would accommodate the activities of a genuine intellectual community. As the mode of instruction changes, what will increasingly be needed are small, intimate and convenient

⁹¹ Elkana, having been for ten years the President and Rector of a small international graduate university in the humanities and social sciences (Central European University—CEU—in Budapest, Hungary), and having tried hard, with partial success, to create an intellectual community, is very well aware, along with his co-author, of how difficult this is to implement.

spaces that allow for personal interaction or work in small groups of faculty and students or students in peer-groups. An intellectual community should not exist in isolation, of course, and hence facilities that allow faculty and students to conduct phone and videoconferences should be readily available. Large lecture halls will primarily be needed for ceremonial purposes, podium discussions and guest lectures. We could summarize the principles of creating an intellectual community under the slogan: “Interdisciplinarity, Internationality and Conviviality” (Walker et al. 2008; Golde and Walker 2006).

On the Purpose of Doctoral Education

What is the purpose of doctoral education? The Carnegie team’s answer is as follows: “The purpose of doctoral education, taken broadly, is to educate and prepare those who can be entrusted with vigor, quality and integrity of the field. This person is a scholar first and foremost, in the fullest sense of the term—someone who will creatively generate new knowledge, critically conserve valuable and useful ideas, and responsibly transform those understandings through writing, teaching, and application.” For all academic settings this definition is comprehensive and satisfactory. We would like, however, to look beyond academic life (Walker et al. 2008, 161).

But first let us see what are those challenges today, which would lead the editors of the volume *Envisioning the Future of the Doctorate* to make the following sharp claim: “In fact, doctoral education may have lost sight of its central purpose.” (Golde and Walker 2006, 4). In this context they invoke the much quoted paper by William James, “The Ph.D. Octopus” (1903). The quotation from this pregnant piece describing the nature of the PhD enterprise is so strong that it is difficult to resist referring to it once again. James describes it as “... a tyrannical machine with unforeseen powers of exclusion and corruption.” If this was true in 1903, it is much more so today. The main problems include the continuous growth (mostly in the humanities in the United States) in the length of time-to-degree and time-to-career; the almost impossible task both to broaden the scope of knowledge of the doctoral student in the discipline and the parallel requirement to make his/her education flexible and interdisciplinary; the underrepresentation of women and minorities, which is far from being overcome in spite of the great efforts that have been made in the United States and elsewhere; and, worst

of all, attrition rates, in which an overwhelming number of doctoral candidates drop out of their programs after years of academic training.

This last point is worth pursuing more fully. In a 2010 published comprehensive comparative study of American doctoral education in the humanities, sponsored by the Andrew W. Mellon Foundation, which examines amongst other things the enormous time-to-degree, as well as the many possible influencing factors and causes of the ever increasing duration of doctoral studies and the growing number of dropouts (Ehrenberg et al. 2010). The National Research Council's comprehensive, exhaustive ranking of American doctoral programs found the length of the time-to-degree a core problem of doctoral studies (Glenn 2010). Further, these studies do not dare to approach the bigger questions, for example, how the subject matter approved for study in a given discipline will influence the career of the doctoral students. The distance between many of the topics for doctoral studies and the important real-life problems that preoccupy humankind is enormous. The undergraduate curriculum deals so little with them that it takes years for students to grasp the real issues, and by that time many have become disenchanted, unmotivated and cynical. If doctoral work were more frequently aimed at solving a concrete problem, more innovative work would be written. Moreover the duration of doctoral studies would likely decrease, since students will feel suddenly a certain pressure to finish their work.

Unfortunately, academia, especially in the social sciences, operates within an intellectual straightjacket. Work on real-life problems is suspect to being non-scientific. Normativity and a practical orientation are also stigmatized. It should be noted on the other hand that all of this should not be misunderstood as a de-legitimation of research topics that do not carry direct social relevance.

The fact that the hundreds of new universities in China and India copy the curricula from the United States or Europe, and send many of their doctoral students to study there, results in a serious neglect of their own scholarly traditions as well as the local and regional problems. These problems should be at the center of their own research and teaching agenda. Since working on such topics seldom receives proper recognition, a focus on them usually does not help in building a scholar's reputation nor is it the stepping-stone for a successful career. As a consequence the curricula taught in these countries are rarely constructed along local needs. Hence, as already emphasized, reorienting the system of incentives is the key to real change.

The Situation in Europe

In Germany, the time it takes to finish a doctorate on average is much shorter than in the United States. The so-called programs for “Promotion” are, however, under-supervised and usually overcrowded, and the professors are hopelessly overextended. If you want to remain in academia after the “Promotion,” you embark on a longer, not necessarily better-supervised Habilitationsschrift (essentially a second PhD which awards the recipient a “*venia legendi*”⁹²—the right to teach at an institution of higher learning). The student to faculty ratio is generally poor. The word “supervising” in a context where many professors “supervise” up to two-dozen doctoral students is frankly a euphemism. As recent determinations of plagiarism in doctoral dissertations suggest, this system has proven to be problematic in various respects.

Fortunately, changes are occurring. Through the Deutsche Forschungsgemeinschaft’s (German Research Council) support in forming Graduiertenkollege, or doctoral studies are morphing into American-style PhD programs. The introduction of the Junior professor position now allows for the hiring of young academics immediately after completion of the doctorate, rather than primarily putting in time waiting for a professorial chair to become available. As Barbara M. Kehm (2007) has emphasized, in a review of doctoral education in Europe, not all researchers with a PhD will look for positions in academe, and therefore their education should differ from the traditional training for academic research, a point also made by David Cyranoski et al. (2011), who argue that few nations have been willing to redefine the PhD as training for high-level positions outside academia.

The League of European Research Universities (2010) published an important report entitled “Doctoral Degrees Beyond 2012: Training Talented Researchers for Society.” Not surprisingly, the report is heavily slanted towards the point of view of society’s needs in the fields of science and technology. What interests the authors is what graduates can contribute to a knowledge-based economy. While they emphasize basic research and frontiers of knowledge, the fundamental presupposition—even if never spelled out so brutally—is that the purpose of the university is to prepare students for the work force. Accordingly, their definition of the purpose of the doctorate is

⁹² The German word *Lehrberechtigung* (right to teach) is obviously a term from another time period.

widely diverging from the one we found in the Carnegie Initiative on the Doctorate. As the LERU report puts it: “Research degrees at doctoral level aim at taking bright Masters graduates with an excellent academic track record (sometimes with work experience) to become creative, critical, autonomous researchers. The evidence of success of the doctorate is a thesis which contains a significant original contribution to knowledge in the chosen field, with the arguments successfully defended by the candidate through questioning by experts” (LERU 2010, 5). This is not just one response amongst many to the issue at hand. LERU represents 22 European universities producing 11,000 doctoral graduates annually, “which is 12% of the 96,000 produced in Europe’s 4000 doctorate awarding universities” (LERU 2010, 4).

We should note the language used throughout this influential document: doctorates are “produced”; they form the “engine of research”; “knowledge is developed, marshaled and disseminated”; universities should aim “to create a better picture for employers of the skills that doctoral graduates from LERU universities have and how they can help drive change.” In short: the report is steeped to the utmost in technocratic, utilitarian language.

This is because in most European countries the emphasis is on the contributions of research to the economy. The starting point is, as usual, the Bologna Process emphasis on post-bachelor “employability,” and this only receives even stronger emphasis for those who complete a doctorate. Nowhere is it mentioned that training talented researchers refers exclusively to the sciences, engineering and technology. It is considered so self-evident that there is no need even to mention it. The social sciences and the humanities are totally missing.

On the positive side, there is awareness in Europe that the traditional mode of research training, relying on the mentor/apprentice model, is being superseded by more structured modes, although there is still very little commitment to more supervisors becoming the norm or to the idea of faculty and students constituting an intellectual community.⁹³

⁹³ In contrast, see Novotny et al. (2001) and Novotny (2005). See also Gibbons et al. (1994).

Doctoral Studies as an Education for Science and Citizenship

The primary purpose of the university should not be the training of a workforce, but the education of concerned citizens for a democratic society. This is also true for doctoral education. Higher education is meant to provide students with the necessary intellectual skills and moral sensitivity to cope with the complex and messy world they will inherit. When they have achieved this ambitious objective, we do not need to worry about their chances on the job market.

It is too often assumed that the “doctorate is all about knowing; the professions are all about doing” (Shulman 2010). Lee Shulman explains that doctoral education “is indeed learning to practice: most centrally to practice research, the practical work of scholars, which is itself a highly complex set of technical understandings, skills and ethical norms,” and most importantly, he states, “These practices of the Ph.D. include: the practices of scholarship (in its many forms—problem framing, question asking, research design, collecting data, analysis, synthesis and integration, theory development etc. as well as powerful clear and persuasive written and oral communication); the practices of design and interaction needed for teaching at large ...; the practices of supervision, guidance and mentoring...; the practices of public service” Shulman concludes, “The holders of Ph.D.’s are not only responsible for serving others through their disciplines; they are stewards of their disciplines or interdisciplinary domains, charged with the responsibility to protect their fields from misrepresentation and corruption, to expand them through original research and synthesis, and enlighten future practitioners and ordinary citizens through teaching and intellectual seduction” (Shulman 2010).

In other words, writing a dissertation is not a “preparation for the workforce” but a form of education that allows students to become good researchers, concerned citizens and critically responsible actors in civil society. In another paper, “Pedagogies of Uncertainty,” Shulman (2005) goes even further in praising professional education: “In professional education, it is insufficient to learn for the sake of knowledge and understanding alone; one learns in order to engage in practice... But a true professional does not merely practice: he or she performs with a sense of personal and social responsibility.”

If there are those who—as many do indeed—would like to juxtapose professional education to liberal education, they would quickly realize that: “... learning ideas, practices and values, and developing the capacity to act with integrity on the basis of responsible judgments under uncertainty, and to learn from experience, is a reasonable description of what liberal learning should be about, as well” (Shulman 2005).⁹⁴

Within the purely academic context, with doctoral education meant for research, there is also a new need to prepare students for practicing interdisciplinarity. While emphasizing again and again the need to teach disciplines as a basis for rigorous undergraduate education, let alone for research purposes later on, we should never lose sight of the fact that almost none of the problems which preoccupy humankind today can be dealt with in the framework of one single, or even two disciplines. Finding the intellectual balance between teaching disciplines and preparing for interdisciplinary work is one of the most challenging tasks of the university of the 21st century.⁹⁵

That these issues have moved to a central place in debates over doctoral education can be seen in a series of articles published in *Nature* in 2011, with titles such as “Editorial: Fix the Ph.D.” (2011); “Reform the Ph.D. System or Close it Down” (Taylor 2011); “The Ph.D. Factory” (Cyranoski et al. 2011); and “Rethinking Ph.D.s.” (McCook 2011). What all these articles concentrate on is the job market, with the message, considering the scarcity of jobs (in most European countries and in the United States, but not in India or China or Singapore) the number of students admitted to doctoral programs should be severely curtailed. It is not reflected upon that there are other purposes for receiving a doctorate than getting an academic position at a university or what such a redefinition of purpose could look like.

Doctoral studies mark the first time in the life of many people—and perhaps the last time—when they are given the opportunity to grapple with a problem undisturbed for an extended period, and actually to find out about their real strengths: in intellectual depth, in stamina, in ability to cope with failure, in the ability to take risks, in finding the right rhetoric for commu-

⁹⁴ Shulman also emphasizes the importance of the curriculum for doctoral training and how a practice-oriented curriculum design is often much better and more systematic.

⁹⁵ Ariel Lindner and Francois Taddei of the Centre de Reflexions Interdisciplinaires (CRI)–Paris Interdisciplinary College (PIC) are dedicating much thought and practical work to that question. See their paper, “Forming the Next Generation of European Interdisciplinary Scientists” (undated).

nicating persuasively the results, and in striking the right balance between steadfastness and perseverance on the one hand and too much security or even arrogance or hubris on the other. Within the framework of a doctorate, students get to know the extent of their own curiosity and motivation—both of which are at least as important as one's intellectual gifts in terms of cognitive capacity.

All these and more are vital for the development of the self, and should be encouraged irrespective of whether the person pursuing this degree is aiming to remain in academe or not. Hence, we also do not want to join the chorus of those who plead for a reduction of the number of doctoral students due to the scarcity of academic jobs. Instead we would like to see a redefinition of the purpose of the doctorate.

If and when the need to publish and doing research becomes decoupled, doctoral training on the whole could become different according to whether the doctoral candidate is aiming for a research and publishing career, or a teaching career, which necessitates research for teaching purposes, or is aiming toward a career outside academe. That could be done only provided the intellectual climate has been changed sufficiently so that a teaching professor or those working outside the university is not a second-class citizen of academe.

Still, it must be taken into account that there are many voices claiming that writing a doctorate is becoming obsolete. A typical article of this kind was written anonymously and published in the *Economist* (2010). Doctoral programs are accused of essentially providing academia with cheap labor for research and teaching in the form of graduate students. The article quotes Hacker and Dreifus (2010) who reported “that America produced more than 100,000 doctoral degrees between 2005 and 2009. In the same period there were just 16,000 new professorships.” It is an especially poignant criticism to claim that the skills that a PhD student acquires can be gained in much shorter time by training on the job. Like most of the discourse on higher education, this argument rests on the question of employability and the economic benefits of higher education. In these terms, the Ph.D. does not seem to contribute as much as it costs in time, energy and money. Over the last few years in a series of articles, Thomas H. Benton has written a devastating attack on doing a PhD in the humanities. He argues that the students are being misled; nobody tells them that not only will there be no jobs for them, but even worse, the degree might hurt their chances of

employment, and drive many of them into despair. Benton argues that claiming the doctorate is about “the Life of the Mind” is one big lie (Benton 2011).

Yet, in spite of these attacks, we believe that the greatest value of the doctorate lies in the once-in-a-lifetime chance to concentrate for several years on one topic and find out about one’s strength, weaknesses and character. While this benefit may be elusive in terms of economic measurement, it will often be of tremendous value to the individual concerned, and also to society at large. Obviously, not telling the students what is awaiting them, and not disabusing those who want a PhD in order to enhance their chances for a certain job and a good income in academe or outside it, is unpardonable and immoral. But not telling them also what intellectual riches they will—if all goes well—acquire, is also not acceptable. Potential PhD candidates must be told that they can start their working life—in all probability, independent of having been awarded a doctoral degree—somewhat later, and if they could afford it, or scholarships helped them through that period, it is summarily a gain and not a loss.

Put another way, new ways of thinking—what we have called, New Enlightenment thinking—will be a better preparation for whatever young people will undertake after their undergraduate studies: directly entering the workforce, going to graduate school, pursuing a research career, or becoming a research or a teaching professor at the university. In other words, what we claim is that a genuine “Life of the Mind” involves awareness of and engagement with the messiness and complexity of the world, instead of an escape from the world.

CHAPTER 10

THE STATUS QUO OF TECHNOLOGY IN HIGHER EDUCATION

Obvious Reminders

The transformative potential of today's technology is visible in many domains of our daily lives. Yet, until recently its impact in the field of higher education has been largely subliminal. While change is in the works, most of higher education is still experiencing the silence before the storm.

In light of the fact that technology is driving down the cost of processing information to zero it is high time for universities to rethink both “what” they are teaching as well as “how” they are teaching. As David Brooks (2013) points out: “The best part of the rise of online education is that it forces us to ask: What is a university for?”

Universities, as entities with complex missions that bundle a number of different core activities, will increasingly face innovative, specialized, flexible, low or no cost alternatives. Therefore we are convinced that at the dawn of the digital age we do not only have to reconsider the teleology of education but also the paradigms of teaching and learning. We cannot cling to the hitherto conventional form of instruction. As we transition from an age of one-way mass media (books, radio and television) to multi-polar Internet communication, faculty and students need to experiment in order to discover how the new tools can be used to turn didactical theory into educational practice. The challenge is nothing less than the invention of a new form of pedagogy that is suitable for teaching a 21st-century curriculum.

The ultimate purpose of higher education is to cultivate an understanding of education as life-long learning, or as pragmatic philosophy would put it,

as a constant process of growth. Given the growth in scope of human knowledge since Humboldt's time and the meaning of global interdependence for the lives and professional careers of today's students, it seems foolish to eternally define "general education" as what you learn in high school, an all-too common phenomenon in Europe. We see the fact that B.A. programs in the US, especially at liberal arts colleges, give students the freedom to learn about varying areas of knowledge before specializing, as one of their distinctive strengths. They open the possibility that innovative trans-disciplinary approaches to knowledge may become an important piece to the puzzle that is the education of concerned citizens.

The overarching economic imperative may well exert the necessary pressure to introduce changes that are desirable from a philosophical point of view. Since it has become common knowledge that most of the jobs that will be in high demand within the next decades either do not exist today or will change substantially, higher education should not (at least not primarily) be about the acquisition of a very specific skill-set. Besides specific skills it should, above all, cultivate a mindset.

If such a mindset instills in students the motivation and capacity to continuously expand the realm of their experiences, it will also allow them to succeed professionally (Dewey 1916, 100ff). Students should be encouraged to actively co-create their own education and to take on the responsibility that comes with concerned citizenship. They should learn to leverage their communal, institutional and civic environment to foster their personal, intellectual and professional development. The freedom for experimentation should be embedded in the institutional structure as well as in the curriculum.

Before we describe the role of technology in all of this, we would like to make three general points:

- I. One could say that it goes without saying, yet it merits a reminder, that higher education is highly diverse (Spiewak 2009). Today, we face a sprawling array of public and private, non- and for-profit institutions. While community colleges or professional academies or technical colleges often provide programs resembling vocational training, major research universities are shaped by the agenda of multi-billion dollar research projects. All the while liberal arts colleges seek to preserve the tradition of humanistic education and focused vocational majors. The teaching effort of all of these institutions is still subsumed under the umbrella term "higher education." An analysis of the retail sector,

however, would of course differentiate sharply between a mom-and-pop shop, a bazaar vendor and the Wal-Mart Corporation. The term “higher education” all too often glosses over essential differences. Therefore, we would like pro-actively to point out a caveat and make clear that we are well aware that what we describe in the following may well affect some disciplines much more than others. The liberal arts, but also more practical disciplines such as law and business are likely to be more affected than those requiring expensive laboratories and equipment such as many of the sciences, technology and engineering programs and medicine.

- II. What seems certain is that neither the rapidly aging (e.g., Italy, Japan and Germany) nor the rapidly growing societies (e.g. Nigeria, Indonesia, Egypt, India, Brazil, China) will be able to provide broad access to high-quality higher education and continuous professional development without the help of technology. Technology could either lead to radical cost reductions, a substantive increase in quality, or a combination of both. That it has yet to unfold its potential in practice is a function of the fact that so far it is largely used as an add-on. We need to rethink the existing system without blindfolds asking ourselves: what is it that is now possible that we simply could not have done before? Generally this question is more likely to be asked by outsiders launching bold initiatives than by reformers within incumbent institutions. The insights propagated by these initiatives will influence the incumbents as cost pressures grow and major structural reforms will ultimately have a profound effect on the way all students learn. In many cases technology acts as a great equalizer. What is available only to the rich at first, within a few years becomes widely available.

On the other hand, people fear that the rising cost of higher education for more and more students (let alone lifelong learners) will lead to a system where contact with a human teacher is a luxury few students can afford. In our opinion this is one more reason to revise our mindless fixation on research, in order to free up professorial time for students. Long-term efficiency gains, the technology dividend if you will, should not lead to a reduction in spending, but to broader access and a renaissance of quality. Technology, for example, can help us cope with increasing heterogeneity. The goal should be to leverage

technology in order to offer all students a flexible, personalized, effective educational experience that is all the while affordable to the public as well as the individual.

- III. Another reminder of the seemingly obvious: we do not know what the future will look like. Predictions about the future are always uncertain. However, one thing about the future does seem certain: it is going to be dramatically different from the world we live in today. Former Harvard University President Lawrence Summers is placing “a bet and a hope that the next quarter century will see more change in higher education than the last three combined” (Summers 2012). Hence, the old mantra of liberal arts education, that a true education is not the preparation for specific circumstances but universal, seems to be more appropriate than ever. Universities whose curricula, organization and methodology aim at employability today, will soon resemble the proverbial army that is perfectly equipped to win the previous war. For higher education to be highly specialized and skills-oriented is just not good enough in this day and age. In other words, higher education has to embrace what we described as a ‘New Enlightenment’ curriculum *because of* technology and *with the help of* technology.

The Digital Revolution and the State of Higher Education

This brings us to the question: Does academia seize the opportunities afforded by digital technology?

The answer is at best mixed. There are isolated examples of innovative pioneers that give us a glimpse of where the sector as a whole is going. But all in all the innovations, which have redefined our lives since the invention of the smart phones, have yet to bring about a comprehensive transformation of higher education.

While many of the ideas driving the technological revolution of our daily lives originated in the proverbial college dorm room—largely by coincidence rather than design—universities have yet to weave these technological innovations, such as online social networks, into the fabric of their organization. Similarly very few of them have begun to rethink their mission against the backdrop of new possibilities. When technology does have an impact it is often at the initiative of individual “rogue” instructors who dare

to leave the confines of the university IT infrastructure. While students are accessing, collecting, organizing, evaluating, combining, editing, publishing, sharing and discussing information in ways that are not only faster and more convenient, but also allow for wholly new forms of interaction (e.g., the “wiki principle”), our understanding of what it means to ‘teach’ has remained relatively unchanged.

Given the increasingly autonomous and yet often collaborative mode of knowledge acquisition and production pioneered by the digital avant-garde, what is the most appropriate mode of teaching for the coming generation? This question urgently needs to be addressed. Already in 1950 Einstein (Einstein 1950, 39) declared, “It is not so very important for a person to learn facts. For that he does not really need college. He can learn them from books. The value of an education [...] is not the learning of facts, but the training of the mind to think [...].” A fair observation at the time, this is a self-evident truth in the age of Google.¹ In fact, Don Tapscott (2009), who conducted a number of very comprehensive studies on the so-called net-generation, concludes that “broadcast learning” (the paradigm that the teacher is imparting knowledge to the student “consumer”) is particularly “inappropriate for the digital age and for a new generation of students who represent the future of learning.” In an article co-authored with Anthony D. Williams, he points out that “[f]or many of the smartest students, it is fashionable to try to get an A without going to any lectures—meaning that the cream of the crop is beginning to boycott the basic model of pedagogy” (Tapscott and Williams 2010).

The verbal presentation of dense academic material in an accessible fashion is helpful to many students, but teaching and learning are not a matter of one-size-fits-all. Moreover, the marginal utility of thousands of highly qualified, well-paid academics explaining essentially the same material at the same time, over and over again, seems very limited. Particularly when it comes to introductory courses there are typically a handful of ways to present the material. Thus there need not and should not be just one authoritative ‘big-brother’ version of a given course. A dozen different approaches, delivered by well-prepared, talented educators should reflect the diversity of opinion within

¹ This attitude is not only shared by intellectuals. See former CEO of Xerox, David T. Kearns’ foreword to Denis P. Doyle’s *Reclaiming the Legacy: In Defense of Liberal Education* (2000, vi).

a discipline. The fixed and the variable costs of producing a university lecture (building a lecture hall, training and hiring a professor, etc.) are enormous.

Professor David Wiley, somewhat of an unofficial spokesperson of the open education movement, and his colleague John Hilton III, point out in a lucid paper on open education that “[t]he cost barrier to producing and distributing information and culture has almost disappeared... We no longer simply read and watch—we now write, record, and publish, too” (Wiley and Hilton III 2009). Technology is driving down the cost of procuring information to zero—sharply highlighting the difference between information and knowledge, ultimately transforming the ‘what,’ the ‘how’ and even the ‘why’ of education (Tapscott and Williams 2010).² Lawrence Summers (2012) argues that higher education “be more about how to process and use information and less about imparting it....tasks will be carried out with far more collaboration.... For most people, school is the last time they will be evaluated on individual effort....new technologies will profoundly alter the way knowledge is conveyed....Professors will have more time for direct discussion with students.” Moreover, he predicts that students will become much more active in their own learning and will engage in what he calls “dynamic learning”. Lastly he predicts “courses of study will place much more emphasis on the analysis of data ... a basic grounding in probability statistics and decision analysis.”

While many are skeptical of such calls for change (Shank 2010), the voices of those who are deeply critical of the status quo keep getting louder. The basic argument is that our model of education is rooted in industrial thinking and is unsuitable for students who will live in a world, which defines excellence not just by accurately executing a given task, but increasingly by creatively disrupting the status quo.³ While Audrey Watters (2015) has convincingly debunked the industrial education metaphor as ahistorical, we think that the widespread criticism of lectures and superficial examinations that use simple multiple-choice questions or the all too common practice of

² The evolution and historical contingency of the university model we know is documented in great detail in Clark (2006).

³ This argument has gained significant currency in education circles thanks to Ken Robinson’s presentations: “How Schools Kill Creativity” (2006), and “Bring on the Learning Revolution” (2010) as well as his presentation at the Royal Society of the Arts “Changing Education Paradigms” (the latter received 1.5 million views on YouTube within 6 weeks).

checking off keywords to test whether students have correctly memorized the instructor's slides, is valid.

Modern technology allows for what Jay Rosen (2009), a professor of journalism, has termed “audience atomization overcome” —today the experience of teaching is no longer limited to a local audience. Tech-evangelist Chris Anderson (2009), founder of the widely acclaimed TED Conferences, a few years ago argued that the mix of technology and the generally increasing importance of education in modern societies will in fact produce ‘rock-star teachers’ who will reach millions, and thus may even earn millions. In its nascent form this can already be observed in South Korea, where star teachers fill stadiums. The global success of the Khan Academy as well as the MOOC phenomenon also point in this direction. The marginal cost of accessing an online course over the Internet from anywhere in the world to share, discuss, cut and paste, remix, and supplement with additional information is virtually zero.

What is called for is a “move from bricks and mortar to clicks and mortar” (Parry 2010b) or – in even more vivid terms – that we usher in a “new renaissance in learning” (Khan Academy <http://www.khanacademy.org>). This is, as Sam Pitroda, technology thought leader and former advisor to the Prime Minister of India believes, a great opportunity: “Technology is a great social leveler, second only to death” (BBC Online: http://news.bbc.co.uk/2/hi/in_depth/sci_tech/digital_giants/8551904.stm) Thanks to the Internet access to information and knowledge as such is already no longer determined by class. There is no doubt that digital access to high quality instruction is next.

Education		Everyday
Analog		Digital
Tethered		Mobile
Isolated		Connected
Generic		Personal
Consumers		Creators
Closed		Open

As a consequence, one thing seems certain: it appears unreasonable to assume that the fundamental shift in the social super-system in which the university is embedded, which has been neatly summarized by Wiley and Hilton (2009) in the diagram, will remain without consequence for education. The heavy burden of proof for the claim that current practices represent the best possible

solution thus lies with those defending the status quo. It is a very improbable proposition indeed and educators should feel encouraged and obliged to experiment.⁴

Jumping the Gun: The Debate on Quality in Online Education

Ever since the introduction and rapid expansion of online learning, a debate has been raging over the quality of this form of instruction. Learning online is still regarded as ‘learning light’ by many in the academic establishment.

In June 2009, a major study entitled “Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies” was published by the US Department of Education (2009) that concluded: “on average, students in online learning conditions performed better than those receiving face-to-face instruction.” While this conclusion was enthusiastically taken up by the pro-technology faction in higher education and has since been cited in numerous articles and blog posts, the report did not remain without its critics.

Some of the critique focused on certain aspects of the findings remaining underexposed, such as the fact that fully online delivery “may even undercut progression among low-income and academically underprepared students” (CCRC 2010). Broader criticism was leveled by a working paper written by a group of researchers at the National Bureau of Economic Research that concluded that “[t]he evidence based on the relative benefits of live versus online education is therefore tenuous at best” (Figlio, Rush, and Yin 2010).⁵

The debate over the merits of online education continues. When Fort Hays State University announced that it would grant credit for courses taken on the commercial online learning service Straighterline, students protested in

⁴ We recognize that many predictions about technological revolutions in education have turned out to be fads. Thomas Edison for example famously declared in 1913: “Books will soon be obsolete in schools ... It is possible to teach every branch of human knowledge with the motion picture. Our school system will be completely changed in the next ten years” cited in Reiser (2001, 53–64).

⁵ The authors found fault with the very studies selected for the meta-study, claiming they were violating basic methodological standards. Principally, they argued that none of the studies included control-group data “that could be directly compared (i.e., similar instructional materials delivered by the same instructor).”

the student newspaper and on Facebook fearing that this would invalidate their degrees (Jaschik 2009). Seemingly the student concerns were not wholly unjustified as a test of Straighterline's offerings by an Inside Higher Ed journalist—conducted more than a year after the events—uncovered that there were still serious issues with the quality of the educational content provided (Golden 2010).

Interestingly, many of these opinions are rooted in fear and prejudice. While some skepticism may be well warranted, faculty attitudes towards online education—which often seem to hover somewhere between disinterest and hostility—are characterized by a provincial skepticism toward the unknown. A survey conducted in 2008–2009 among 10,720 faculty members at 69 colleges and universities in the United States revealed that never having taught an online course did not prevent a full 82% from rating online courses as “inferior,” whereas “[a]mong faculty with online teaching or development experience a majority believe that the learning outcomes are as good as or better than face-to-face instruction” (APLU 2010). A 2013 report states: “Only 29.1% of chief academic officers believe their faculty accept the value and legitimacy of online education. This rate is lower than the rate recorded in 2004” (Allen and Seaman 2013).

Professor Alexander C. McCormick, Director of the National Survey of Student Engagement, raises an important point: “The truth is that we know astonishingly little about the ‘quality’ of nearly all collegiate programs, whether face-to-face or online.” When asked by *The Chronicle of Higher Education* (2010) about the quality of online learning he points out that:

The real issue is the warrant for claims of educational legitimacy of individual courses as well as entire courses of study. Skepticism about online education is typically rooted in questions about whether it meets the same quality standard as face-to-face instruction. But that base line has not been subjected to comparable scrutiny. The long-term benefit of the expansion of online education, then, is likely to be a much-needed articulation of what counts as college-level learning in any format and of what a bachelor's degree stands for.

The term “online education” itself is misleading and cries out for differentiation. Surely the enthusiasts of “online education” would be hard pressed to uphold the assertion that *all* of what makes up the experience of studying at a university can be replicated online. On the other hand, the critics of “online education” would find themselves in a state of denial, if they were to claim that online

programs couldn't possibly achieve comparable outcomes. Moreover, the online option deserves exploration, if only because of the opportunities it affords to non-traditional students such as working adults. Providing more non-traditional students with access and the freedom to pursue an education of their choice alone would be worth the effort of developing new online and hybrid formats.⁶

Taking Stock—the Status Quo of Online Learning Today

Although the strict distinction between conventional education and online learning will disappear in the years to come, it is still very much palpable in the present day.

Two important surveys provide a good perspective on the status quo a few years ago: the Sloan Consortium Report (Sloan 2010) and the WCET–Campus Computing: Managing Online Education (MOE) survey (Campus Computing Project 2010).⁷

According to the Sloan Report almost one third of the roughly twenty million full-time and part-time students of all ages enrolled in the United States were already taking at least one online class for credit. The MOE survey found that almost all of the survey participants expected their institution's online enrollment to increase in the future. Interestingly, most of the students taking online classes surveyed said they were taking courses that were also available on-campus.

The shift towards online and hybrid education so far has been happening bottom up. Online education typically is a trademark of the large overrun state schools as well as the academically less reputable community and private for-profit colleges and universities. Research universities, especially private ones, still tend to avoid the introduction of for-credit online courses. Where they do exist it is typically in the context of continuing and executive education. The elite universities have been hesitant when it comes to

⁶ Mark David Milliron (2010), Co-Founder and Chief Learning Officer of Civets Learning, suggests: "It's time we move beyond these dichotomous diatribes to a more nuanced exploration of how we can apply the entire family of tools, techniques, and resources at our disposal to help our students learn deeply, become active citizens, and complete their educational journeys with a credential in hand."

⁷ An excellent source for tracing the evolution of online learning is the Online Learning Consortium: www.onlinelearningconsortium.org.

introducing fully online courses in undergraduate education. However, the new wave of online initiatives that was caused by the MOOC phenomenon is poised to end this abstinence.

Individual institutions show where universities in general may be heading: the University System of Maryland already requires undergraduates to take 12 credits in so-called ‘alternative learning modes,’ which includes online learning. According to the *The Chronicle of Higher Education*, “Texas has proposed a similar rule” (Parry 2010). At the University of Central Florida more than half of the university’s 56,000 students are taking online or blended classes.

The growth process and support has been growing at substantial rates. The Bill & Melinda Gates Foundation “has made blended learning a cornerstone of its new \$20-million education-technology grant program” (Parry 2010), subsequently offering grants of \$12.9 million and \$20 million for technology in community colleges and in digital courseware development. The non-profit Khan Academy, a Gates Foundation grant recipient, provides access to hundreds of teaching videos explaining concepts across a broad range of disciplines free of charge (Khan Academy <http://www.khanacademy.org>).

At this point it should be noted that the impact of digital technology and connectivism will of course not only affect teaching. All of the core functions of the university will be affected. For example, online social networks have already profoundly transformed the socialization and networking function that universities traditionally fulfill.⁸ Life on campus without the likes of Facebook, Whatsapp, Snapchat etc. for many students is hard to imagine. As far as research is concerned, in certain fields it is the way that research is being conducted that is affected, in others it is more the way it is reviewed, published and used that is changing. The university’s certification function, as well as the assessment function on which certification is based, so far are less affected. Ultimately, however, all of the core functions of the university (e.g., teaching, research, assessment, certification and socialization) will be affected.

⁸ This may be even truer for European universities that traditionally are less tightly knit social communities as students typically live off campus.

The Paradigm Shift in Teaching

To begin with let us share a few observations about the way higher education worked up to now. At the beginning of a semester universities would descend into a frenzy as everyone tried to find the right classes. Students typically had to make tough choices on the basis of scarce information regarding class quality and content. Once they decided to take a class they were locked in. The syllabus represented the set menu for semester. For the duration of roughly 3 months between 10 and 300 students were subjected to a common treatment, either in form of a lecture or a seminar. They could only take the classes available at the institution they attended (sometimes only in their own department if it was inconveniently located) and once a class was full (often dictated by the physical size of the room where it was to take place), no one else who was interested could join. They could only hope then that it would be offered again next semester. They could not take classes that had been taught in previous years. The material was not adaptive and everyone was learning at the same pace. Curricula and course offerings were wholly supply driven, and personalization required bureaucratic procedures. Outside of class students for the most part were studying the material on their own, or in small study groups. Finding peers that shared their interest was essentially a matter of luck. While students read the material that professors at other universities had written, taking their actual classes was impossible. If the institution where she was teaching did not happen to be next door, one had to transfer to the university where the professor was teaching for at least one full semester to take their class. Students with similar interests studying in different cities usually only got the chance to exchange ideas when they serendipitously met in extra-curricular contexts such as student conferences. Faculty used to be somewhat mobile as visiting professors, but these exchanges were infrequent and rarely driven by student demand. Thousands of professors with little knowledge of or interest in learning theory spent hundreds of hours each on preparing and giving lectures to hundreds of students in large lecture halls. More or less simultaneously thousands of their colleagues elsewhere gave very similar lectures—of often mediocre quality—on the same material. Neither students nor professors entered in any form of substantive exchange with their peers at other universities on the content or quality of teaching.

This reality has already begun to crumble; it will simply be inconceivable for the children of today's student generation. Even today none of these limitations in terms of access and quality would have to exist in as drastic a form anymore. In view of what is already possible, today's academic reality already feels like an anachronism. Yet unfortunately, the above description still represents a mostly accurate depiction of the daily routine at the vast majority of contemporary universities. Education still operates under a paradigm of scarcity, while we already live in a world of knowledge abundance.

Clearly, simply providing access to taped lectures is not teaching and it is not what is going to change all of this. Yet, the impact of online video and interactive platforms should not be underestimated. We believe it will soon do for teaching what the book did for research. It will take the variables of time and space out of the equation.

Table 1. Internet vs. other media

	Time	Space	Text	Images	Video	Interactive	Social
Print	×	×	×	×	-	-	-
Radio	~	×	-	-	-	-	-
TV	~	×	~	×	×	-	-
Internet	×	×	×	×	×	×	×

The table above illustrates that the Internet does not represent an incremental improvement of existing forms of media. It is fundamentally different from other forms of media in that it allows for vertical as well as horizontal communication. The Internet delivers different forms of audio-visual content independent not only of location, but also of time. It is thus the first medium that allows for instantaneous user interactivity and collaboration. Online a student is not simply a passive consumer of educational content, but through active engagement becomes a co-producer of a joint educational experience.

This is nothing short of a paradigm change. Cathy N. Davidson & David Theo Goldberg in a report for the MacArthur Foundation stated it unequivocally: universities have to confront the reality that the world has “suddenly, irrevocably, cataclysmically, epistemically changed—and changed precisely in the area of learning” (Davidson and Goldberg 2009). They go

on to explain that today a participatory and networked culture of learning is emerging, “stressing cooperation, interactivity, mutuality, and social engagement for their own sakes and for the powerful productivity to which it more often than not leads.”

We often find parallels to what has happened in the music industry: “Much like the founders of Napster shredded the notion of an album, allowing users to remix songs,” educational technology “is hacking the format of a class” (Parry 2010b). Hacking education and dissolving the rigid structures that until today have limited the access to teaching, however, carries implications that extend way beyond the individual classroom. As an article in the *New York Times* described open education: “If the mission of the university is the creation of knowledge (via research) and the dissemination of knowledge (via teaching and publishing), then it stands to reason that giving that knowledge away fits neatly with that mission” (Hafner 2010).

It is this insight that has first spawned “open educational resources” (OER) and later “Massive Open Online Courses” (MOOCs). The former are learning resources such as lecture notes, teaching plans or practice assignments. The later are full-blown online courses. While the former have done comparatively little to change higher education practice, the latter created enormous expectations when they burst onto the scene in 2012. While the attitude that Stefan Collini (2012) described as “intellectual mercantilism” is widespread, we believe that the insight that expertise is non-rivalrous will prevail and that the movement to open up education online will ultimately have a transformative impact on the academy.⁹

⁹ For a comprehensive discussion of MOOCs, see Hollands and Tirthali (2014).

Examples of Innovative Practice

In the following we would like to present some experiments, innovative institutions and exciting new approaches:

Open Educational Resources

The most commonly used and, at the same time, most controversial open educational resource is Wikipedia. Educators often demonize Wikipedia as being unreliable and thus bar students from using it, and generally do not allow it to be cited in academic work. We consider this fundamentally wrong in principle. As with any other source of potentially dubious quality, teachers should instead give students the additional task of elaborating why they consider it worthy of being cited in a particular instance and spell out caveats where necessary. The discussions, going on in the background of Wikipedia articles, are often the kind of conversations that we would like students to have more of. It is the collaborative critical engagement of sources that lets the Wikipedia community take many pieces of information and form them—sometimes more successful, sometimes less—into knowledge. Notably the Wikimedia foundation has recently teamed up with a number of professors in the field of public policy, who have made the improvement of Wikipedia articles a cornerstone of their classes. Students learn critical thinking through practical application of their knowledge and in the process contribute to a global public good (Chapman 2010). This work on a real-life problem, participating in the evolutionary process of knowledge creation while constructively criticizing the use of sources, conveys in an ideal sense the ideas behind the New Enlightenment.

When it comes to a more strict definition of OER, prior to MOOCs, MIT's Open Courseware was the most well-known and most frequently-cited experiment in open education. Although it was not the first project of its kind, MIT's decision in 2001 to make its course materials (primarily syllabi and reading lists) accessible to the world free of charge gave a key impulse to the OER movement. The experiment served as an inspiration to many educators around the world. Thus in 2004 the OpenCourseWare Consortium was launched as an international platform for open education

experiments, which is by now connecting more than 200 institutions worldwide.¹⁰

In 2006, Yale University, with the support of the Hewlett Foundation, decided to hop onto the open education bandwagon as part of its overall strategy to internationalize the university. Rather than copying MIT, however, Yale decided to opt for high-end video lectures. Filmed by two cameramen, these sought to capture the classroom atmosphere, including student questions. Thus they provide much more than the rather abstract form of access provided by most of MIT OCW's documents.¹¹ Interestingly Yale much like MIT was categorically opposed to offering exams, let alone granting course credit to outsiders. So while the stated objective was to produce high quality course videos that come as close as possible to replicating the classroom experience, Yale insisted there was a fundamental difference.

The real issue in these cases of course was a concern for the brand names.¹² Professors placed more importance on the context within which their course was delivered than the knowledge conveyed or competencies acquired. In other words receiving credit from MIT or Yale was not about successfully mastering the concepts taught. Which of course raised the question what it was actually about. This pressing exercise in soul-searching was finally forced upon the academy by the MOOC phenomenon in 2012.

Another very prominent project within the OER movement is Khan Academy. When Salman Khan, a former hedge fund manager, began offering

¹⁰ Rice University, in Houston, developed an open platform called OpenStax CXN, which started as a grassroots initiative to crowdsource free courseware in 1999. Over time it provided access to more than 17,000 individual learning objects, so-called modules, and over 1000 collections (textbooks, journal articles, etc.). Support was provided by the William and Flora Hewlett Foundation as well as the Maxfield Foundation, the Twenty Million Minds Foundation, the Shuttleworth Foundation, National Instruments, the National Science Foundation, and the Open Society Foundation.

¹¹ After 755,000 US dollars were made available, an additional 2.25 million dollars were approved in 2007, leading to the taping of a total of 35 courses as of early 2011. Something similar was also done at Harvard, with the taping of Michael Sandel's famous course on 'Justice.' The course was published online and screened on PBS.

¹² The provost at MIT reported in an interview that a committee of professors told him at the start of the OCW Project that it must be clear that the use of these teaching materials will have nothing to do with real teaching at MIT. Cited in Walsh (2011, 244). See also: d'Oliveira, Carson, James, and Lazarus (2010) and Iiyoshi and Kumar (2008, 213-227).

his cousin tutoring through YouTube videos, they turned out to be unexpectedly popular. Since then, his hobby has become a profession, and he and his team have produced over 2400 teaching videos that have been viewed hundreds of millions of times. In other words, one person acting alone, and for a long time without external financing has become a tutor to millions. This story would have been very hard to imagine only ten ago. His videos are still available for free and are presently, through the financial backing of Google, translated into other languages (see Khan Academy. <http://www.khanacademy.org>).

Another interesting example that makes use of the resources just mentioned is the University of the People (www.uopeople.edu). Initiated in 2009 by Shai Reshef, a former for-profit educational service company executive, as part of the Global Alliance for Information and Communication Technology and Development of the United Nations, the university describes itself as “the world’s first tuition-free online academic institution dedicated to the global advancement and democratization of higher education.” The idea is to develop a high-quality open university model that makes autonomous higher education available to all. Except for a low application fee and an exam administration fee, UoPeople is entirely free of charge. For instruction UoPeople relies on free syllabi and open educational resources from open courseware projects. A handful of instructors moderate and invigorate “peer-to-peer” discussions of open educational resources and help students by answering questions if they get stuck. For the most part, however, students are expected to learn autonomously. UoPeople is approved to operate by the State of California and to award degrees by the California Bureau for Private Postsecondary Education (BPPE).¹³

National Center for Academic Transformation
—Program in Course Redesign

Already in the late 1990s an avant-garde initiative financed by The Pew Charitable Trusts set out to leverage the opportunities afforded by technology

¹³ There is of course a certain risk of devaluation associated with accrediting novel (and in this case innovative) providers of higher education. But competency-based programs may prove to be a remedy here as they will make it easier to understand what outcomes students actually achieve.

to improve the teaching process and thus the learning experience at mass universities. In the context of the Program in Course Redesign (PCR), the National Center for Academic Transformation (NCAT) worked with 30 institutions in order to redesign “large-enrollment, introductory courses using technology to achieve cost savings as well as quality enhancements.”

Each of the institutions chose from among 5 approaches for reshaping teaching:

- 1) The supplemental model (used by 6 institutions) retains the basic structure of the traditional course and a) supplements lectures and textbooks with technology-based, out-of-class activities, or b) also changes what goes on in the class by creating an active learning environment within a large lecture hall setting.
- 2) The replacement model (used by 14 institutions) reduces the number of in-class meetings and a) replaces some in-class time with out-of-class, online, interactive learning activities, or b) also makes significant changes in remaining in-class meetings.
- 3) The emporium model (used by 4 institutions) eliminates all class meetings and replaces them with a learning resource center featuring online materials and on-demand personalized assistance, using a) an open attendance model or b) a required attendance model depending on student motivation and experience levels.
- 4) The fully online model (used by 5 institutions) eliminates all in-class meetings and moves all learning experiences online, using Web-based, multi-media resources, commercial software, automatically evaluated assessments with guided feedback and alternative staffing models.
- 5) The buffet model (used by 1 institution) customizes the learning environment for each student based on background, learning preference, and academic/professional goals and offers students an assortment of individualized paths to reach the same learning outcomes” (quoted from National Center for Academic Transformation website: www.thencat.org; see Twigg 2003).

The results of these course redesign experiments were a tremendous success. The numbers in the table below state how many institutions experienced an improvement, deterioration or no significant difference concerning the respective indicators. The savings indicator reflects the minimal, maximal and average percentage differences in course operating costs between traditional and the redesigned formats.

Table 5. Outcomes of PCR

	Outcomes			Completion/Retention			Savings		
	+	-	± o	+	-	± o	Min.	Max.	
Round I (1999–2001)	5	o	4	7	o	3	16%	77%	34%
Round II (2000–2002)	9	o	1	6	2	2	25%	74%	38%
Round III (2001–2003)	8	o	2	5	1	1	15%	56%	39%

NB: Where numbers do not add up to ten, the results were either inconclusive or not reported; one experiment remained inconclusive.

Source: <http://www.thencat.org/PCR/Outcomes.htm>.

Total savings from the redesign of 30 courses amounted to more than \$3 million dollars or slightly more than \$100,000 per course. These savings primarily reflect “decreased time spent by instructional personnel (full-time faculty, adjunct faculty, graduate teaching assistants) and/or substitution of less expensive personnel.” As we mentioned before, these savings should be reinvested to provide for the many things that are currently not provided due to a lack of resources.

The most important insight from the PCR, however, was that there are strong indications that technology can *indeed* help to improve the quality of instruction as demonstrated by indicators from learning outcomes, to dropout/failure and course completion rates, test scores, grades and even student and faculty satisfaction.¹⁴ It seems startling that almost two decades have gone by since these experiments were carried out and yet to our knowledge none of the different models has seen widespread adoption in Europe.

William Bowen et al. (Ithaca S+R)—Randomized Trials at Public Universities

More recently William Bowen, former president of Princeton University, and his colleagues took the next step in investigating the impact of technology on campus. In a study published in 2012 they investigated the

¹⁴ For complete data we recommend consulting the comprehensive documentation on the NCAT experiments found at www.thencat.org.

learning outcomes of students at public universities in rigorous randomized control group experiments. What they conclude is that “hybrid-format students took about one-quarter less time to achieve essentially the same learning outcomes as traditional-format students.”¹⁵ The researchers also sought to address the cost issue in an attempt to evaluate whether technology may prove to be a remedy for Baumol’s disease. On this count Bowen’s very carefully worded report comes to a clear verdict: “We are persuaded that well-designed interactive systems have the potential to achieve at least equivalent educational outcomes while opening up the possibility of saving significant resources which could then be redeployed more productively” (Bowen 2012, 28).

Carnegie Mellon University—Open Learning Initiative

Funded by a grant from the Hewlett Foundation, Carnegie Mellon University (CMU) began to develop the Open Learning Initiative (OLI) offering on-demand instruction in September 2002.

The idea was to re-design the course experience through what is described by the OLI as “a team-based redevelopment approach involving learning scientists, faculty content experts, human-computer interaction experts, and software engineers.” The results of this effort are “web-based learning environments that are the *complete enactment* of instruction” (Thille 2008). Similarly former CMU President Jared L. Cohon distinguished OLI from other courseware initiatives that only offer teaching materials as follows: “We created a platform... that delivers a course, an educational experience—that is a very different thing” (quoted in Walsh 2011, 102). Students are guided through the material, their progress is continuously assessed through quizzing and the material is adapted to their needs. The journalist Anya Kamenetz (2010) draws the following analogy: “It is what might happen in a classroom under ideal circumstances, with a teacher of infinite patience, undivided attention, and inexhaustible resources of examples and hints.”

¹⁵ Bowen, Chingos, Lack, and Nygren (2012, 2013). See also Bowen’s lecture at the Tanner Lectures Stanford University: “The ‘Cost Disease’ in Higher Education: Is Technology the Answer?” (2012). All citations are available at the Ithaka S+R website.

There are two clear benefits to this form of instruction. Firstly, such technology solutions allow for universal access to automated, but highly effective individualized instruction. Secondly, they enable new forms of peer-to-peer interaction and collaboration and, maybe most importantly, free up significant amounts of time for direct supervising, tutoring and mentoring by faculty members.

Candace Thille points out that “oftentimes the faculty expertise is wasted... You have this poor faculty member, who is sitting there as an expert in their area trying to figure out how to transfer their expertise to this large number of students, who are all variable. And it is a horrible task. The affordances of the technology and also the learning sciences... for the first time enable us to really think about how to scale in a much more effective way, so we truly can serve many, many, many more students” (quoted in Kolowich 2009). Letting students learn basic introductory material at their own pace through individualized instruction is a win-win proposition. It is more effective than the lecture format and economizes on valuable classroom time. As a consequence students, according to Thille, “can spend... class time going deeper and doing something much more interesting, so they can really leverage that you are an expert” (quoted in Kolowich 2009). This model allows courses to explore the important, but often-neglected epistemological questions posed by the ‘New Enlightenment;’ the kind of questions which generally lie beyond the reductionist models used in introductory theory. Teaching introductory courses this way would not only be more interesting for all involved, that is, for professors as well as students, but it would also be an important step towards educating concerned citizens.¹⁶

A new Open Learning Initiative is now seeking to improve instructional quality at those very institutions that are most commonly associated with all the woes of the mass ‘university’ phenomenon: community colleges. The overarching goal of this initiative, which is supported by a number of leading foundations, is to “demonstrate a 25% higher rate of course completion for

¹⁶ Institutions that would like to experiment with this approach to teaching do not have to re-invent the wheel. The OLI offers its courses, for a fee, to students from other institutions. Instructors elsewhere can customize OLI courses and gain access to comprehensive analytics data allowing for on-going and comprehensive student assessment.

students from vulnerable populations.”¹⁷ Preliminary results appear to be extremely promising raising course completion rates from 41% to 99%.¹⁸

Western Governors University

The issue of what really matters, ‘the experience’ or learning outcomes measured by ‘demonstrated competence,’ prompted a response from another innovative institution: Western Governors University (WGU). Founded in 1997 and named after 19 governors from the western United States, WGU is a fully online university, offering “competency-based” degree programs. What this means is that unlike credit-based programs requiring students to spend a set amount of time on taking courses, WGU only requires students to demonstrate a certain level of competence. In theory it is possible to pass all the required exams and writing assignments, receive a diploma and never once go to class.

Students certainly seem to appreciate the competency-based approach: WGU enrollment between 2008 and 2010 nearly doubled to almost 20,000, with ca. 30,000 as of early 2012 and stands at some 68,000 students in 2016. WGU costs \$2,980.00 per 6-month semester, comparable to what students pay at other low-cost public universities; from that tuition, however, the university fully covers its own expenses, effectively meaning that the model increases educational opportunity without draining state budgets (Ledermann 2010).

Southern New Hampshire

Southern New Hampshire, a private non-profit, has been generating numerous headlines in recent years due to its stellar rise. It now serves about ten times as many students online than it does on its traditional campus of 3800 (Krisner 2014). Its *College of Online and Continuing Education* is

¹⁷ Community College–OLI <http://oli.cmu.edu/get-to-know-oli/get-involved/see-our-current-projects/community-college-oli/>.

¹⁸ See the EducCause powerpoint presentation on Continuous Improvement in Teaching and Learning, <http://net.educause.edu/ir/library/powerpoint/NGLCSLS04.ppt>.

reported to generate \$200-million in revenue and in 2011 posted a 41-percent “profit” margin (Pulley 2014; Parry 2011).

SNHU certainly is an interesting case study for anyone interested in change-management at a non-profit. President LeBlanc explains its success this way: “We ensured substantial faculty voice, but we removed faculty veto power,” adding that at most other institutions, “when faculty raise their voices vociferously, the initiative stops. And here, it can’t stop. It can’t be bogged down.”

SNHU also has a competency-based program similar to that at WGU entitled “College for America” that has no courses or traditional professors. It allows working-adults to progress toward an associate degree by demonstrating mastery of 120 competencies. “Competencies are phrased as “can do” statements, such as “can use logic, reasoning, and analysis to address a business problem” or “can analyze works of art in terms of their historical and cultural contexts.” Also financial aid may be awarded based on students’ mastery of competencies rather than the number of accumulated credits” (Parry 2013).

Major Themes of Emergent Innovation

After having analyzed the current state of higher education technology as well as a handful of innovative lighthouse projects, we would like to take a look ahead and describe some of the concepts, tools and practices that have been developed in recent years and that will reshape the practice of teaching and learning in the coming years.

Game-based learning

One of the major trends that is believed to have significant potential is game-based learning, or applying the principles of play to the learning process.

In an presentation entitled “Gaming can make a better world” at TED2010, Jane McGonigal presented the idea of Serious Games, which breaks down the solution of societal problems to the level of subtasks which, within the framework of computer games, are called “quests.” These tasks make it possible for players to come up with solutions through a playful form of

voluntary participation, collaboration, problem-solving, and procedural thinking, enhancing the possibility of introducing real-life problems into courses and allowing students to develop the so-called “gamer disposition”.¹⁹

In their analysis of the learning collectives formed by players of online multi-player games, Thomas and Brown conclude that these loose networked groups produce and “process an astounding amount of information on a continual basis, seamlessly integrating new knowledge.” Designing teaching formats that, like games, are characterized by a “rich social context of peer interaction, feedback, and knowledge construction” enabled by a technological infrastructure that promotes “intense, autonomous, interest driven learning” is their recipe to achieve such an awakening. They call the resulting form of learning “collective indwelling.” Ultimately, Thomas and Brown conclude that “games may in fact be one of the best models for learning and knowing in the twenty first century” (Thomas and Brown 2011). The idea itself is not new.²⁰ But technology allows for wholly new applications. In particular it is the scalability of technology solutions that makes the significant time investment that is necessary to craft a high-quality experience worthwhile.

A concrete example of such games are the games by the Danish company, Serious Games Interactive, with its ‘Global Conflicts’ series, encourages students to explore the Israeli–Palestinian Conflict, the Drug War in Mexico as well as social issues such as labor rights in sweatshops and the use of child soldiers (Global Conflicts online. <http://www.globalconflicts.eu>). The player investigates the virtual world as a journalist in an attempt to uncover the ‘true’ story. In order to ‘win,’ the player has to choose the right quotes that most accurately reflect the perspectives of all sides involved in the conflict and write an article that makes it onto the virtual front page. Real-world seminars that run parallel to students’ disciplinary education would provide fruitful territory for experimenting with such approaches. The technology is there. Now it is up to the academics to develop scenarios within which students can discover complex subject matter through play. In addition gamification may help to motivate, filter and match students to each other or specific courses based on their specific profiles.

¹⁹ See Jane McGonigal’s “Gaming can make a better world,” 2010 (<https://www.youtube.com/watch?v=dE1DuBesGYM>) and Thomas and Brown 2011).

²⁰ One of its most concise formulations can be found in Huizinga’s (1971) study on the play element in human culture.

Learning Analytics: Towards Formative and Evaluative Assessment

Complex learning analytics will fundamentally transform our understanding of student assessment. The objective of so-called learning analytics is “to study student engagement, performance, and progress in practice” so that educators may use “what is learned to revise curricula, teaching, and assessment in real time” (The Horizon Report 2011; see also Wu 2013; Siemens 2011). In all of this it is clear that in the near future, as Salman Khan (2011) writes, “students will be learning at their own pace, with all relevant data being collected on how to optimize their learning and the content itself. Grades and transcripts will be replaced with real-time reports and analytics on what a student actually knows and does not know.”

The comprehensive knowledge, resulting from the rich data that is effortlessly collected, will allow us to move from purely evaluative assessment—the exam at the end of the semester—to continuous, formative assessment that allows for automated or manual interventions that put individual students back on track.

Even when this cannot be applied evenly in all fields of study, the idea appears promising. One such application, designed to help reduce the dropout rate, is a program called Signals that was developed at Purdue University. Signals “detects early warning signs and provides intervention to students who may not be performing to the best of their abilities before they reach a critical point” and thus helps to bolster student retention (Parry 2012; see also the information on Arizona State University’s eAdvisor program: <https://eadvisor.asu.edu>).

Another field in which analytics may have a major impact is the content itself. The fact that today’s learning resources do not collect meta-data about usage that could be used to improve the resource itself makes them rather archaic tools for learning. The next generation of textbooks will be rather fluid compilations of content that present themselves to the reader depending on his or her needs and level of understanding. In the academic world, this technology is being applied not only at Carnegie Mellon University’s OLI. Adaptive learning software and interactive and social ebooks, already give us a hint of what will be possible in this respect.²¹ The hope is that analytics will

²¹ See knewton.com for a discussion of adaptive learning.

be able to provide comprehensive individualization, differentiation and personalization of learning.

New assessment formats—such as “serious games”—can turn into wholly new, superior forms of evaluation both in terms of ‘depth’ as well as efficiency. Passing the test may soon simply mean getting to the next level. Thus, we hope to see more meaningful, multidimensional forms of assessment—including collaborative elements and peer-assessment—that adding another piece to the puzzle that is the picture of the future of higher education.

Collecting data throughout the educational process also has ramifications for certification. Student learning data may feed into institutionally verified online-identities and knowledge portfolios that may soon replace the transcript. The abundance of data allows us to maintain live report cards that can create much greater transparency and comparability than today’s system of standardized testing and credit points. This does not mean that grading has to descend into some form of positivist, Orwellian data-mania. In fact, we hope that just as with teaching, the opposite will be the case. Technology can help us to re-humanize education. Digital tools can free up time for analogous instruction and evaluation. Not having to grade standardized tests, teachers will be able to do what they are uniquely qualified for and that is to add, what Clifford Geertz (1973b) has called, “thick description” to the sea of “objective” data. The result would be a form of certification that is more robust, more quantitatively accurate as well as more qualitatively differentiated.

Online Social Networks and the Social Fabric of the University

Online social networking today is a mass phenomenon. In higher education, online social networks offer the chance to connect teachers and students as well as students to each other on a virtual meta-campus. We see this trend toward connectivism as a chance to overcome the anonymity of the mass university—especially in Europe—by facilitating connections amongst like-minded individuals—not just online, but offline as well. Online campus networks will not only mirror real-life connections, but will also serve to create new ones by helping individuals to find others with similar or tangentially relevant academic interests. By facilitating the decentralized, course-independent and interdisciplinary dispersion of information, opinions

and value judgments within the university and beyond, these networks will serve as the knowledge society's equivalent to the transmission belt.²²

When it comes to the role of the Internet, the fact that it provides immediate access to information is typically cited as its most profound impact. In light of the tremendous success of online social networking as well as the emergence of new communication channels such as e-mail, chat and video-calling, it seems clear that the Internet is also a tremendous help when it comes to building, expanding and sustaining networks of dispersed individuals. We concur with Brown and Adler (2008), who contend that “[t]he most profound impact of the Internet is its ability to support and expand the various aspects of social learning.” Richard J. Light (2001), who more than 15 years ago at Harvard University, identified the ability to form and participate in small study groups as *the* most important determinant of student success in college. Students who study in groups—even if only once a week—were more engaged, better prepared and studied decisively more than students who studied alone.

Unlike the consumer web, where there are many more or less global product standards, no such standards exist as yet in the realm of education. To this date both the commercial as well as the open-source software solutions in this space have a notoriously terrible user experience. Moreover they still operate under the class delivery paradigm as closed silos, instead of truly embracing peer-to-peer collaboration and the open web. Redesigning these systems with a focus on peer-to-peer collaboration and co-creation will be an important step towards creating a digital learning ecosystem worthy of a 21st-century university. Ultimately these systems will become as vital to a university's vitality as the campus itself (Fischman 2011). This digital meta-layer will be an essential aspect of the social fabric in the university community. New governance applications facilitating dialogue, feedback or organization for joint action, even participation in decision-making and budgeting, could run on digital administrative platforms. The potential of these applications for the democratic allotment of tuition fees or alumni donations, for example, is obvious. As Brown and Adler (2008) conclude: “The 21st-century university will be a network and an ecosystem—not a tower.”

²² For some general theoretical considerations on this, see Bencher (2008).

Data-Mining, Crowdsourcing and Citizen Science

Digital technology has already had a profound impact on research in many fields. Cutting edge research—not only in the sciences—is barely imaginable in many disciplines without the help of technology. Particle accelerators and genetic research immediately come to mind. But digitalization is also influential where we might not expect it.

Two developments exemplify this: the rise of data mining in the humanities and the crowdsourcing across disciplines, something that is known as Citizen Science.

Projects such as Google Books have digitalized millions of books. This enormous amount of new data is set to spawn wholly new forms of scholarship that we can refer to as “digital humanities.” As *The Chronicle of Higher Education* reports “[f]or any discipline where research focuses on books, some experts say, academe is at a computational crossroads. Data-diggers are gunning to debunk old claims based on ‘anecdotal’ evidence and answer once-impossible questions about the evolution of ideas, language, and culture” (Parry 2010c).

This form of inquiry does not have to be antagonistic to traditional scholarship based on close reading, but should be seen as complimentary. In a sense it is just another weapon in humanity’s epistemological arsenal. As one professor put it: “Data mining may prove a useful device in our longstanding effort to understand our cultural inheritance” (McGann et. al. 2010).

The same could be said about social relations. Social network analysis is a crucial technique in modern sociology that is also being used in anthropology, biology, business, communication and organizational studies, economics, engineering geography, information science, social psychology, and sociolinguistics. The Internet in general and e-commerce, web-traffic and online social networks in particular are providing researchers with an unprecedented wealth of data on human behavior, social interactions and networks. Analyzing that data will generate invaluable insights.

The other application of digital technology, which seems to hold great promise for research is crowdsourcing. Researchers are calling on the public to help solve a task or find the answer to a question. Crowdsourcing is very familiar to academia in the form of the call for papers. Yet the power of this idea has grown exponentially due to the Internet’s reach as well as the speed

and facility of online interactions. Businesses, non-profits and research projects have built a number of successful platforms that harness different forms of crowdsourcing (Howe 2009).

The first and probably most well-known, alas rather passive, crowdsourcing project was undertaken in the field of data processing: the SETI project at the University of Berkeley (SETI@Home). For many years now, SETI@Home has been making use of private computers' idle time to process data packages in the search for extraterrestrial life. Newer forms of crowdsourcing, however, increasingly leverage human 'cognitive surplus.'

Crowd voting, for example, helps with processing large amounts of data. Internet companies for a long time have relied on user votes to identify interesting pieces of content in a vast sea of data. *The Guardian* has found applications for "crowd identification" in journalism, employing readers as mechanical turks who help editors with sifting through large volumes of government files.²³ The same approach has turned Astronomy "from a largely solo pursuit to a discipline in which sharing is the norm." Telescopes and major observatories collect enormous data sets and then "[a]mateurs are invited into the data sets through friendly Web interfaces" (Young 2010b).

The involvement of the public in research can take an even more active role in the form of "crowd observation." Projects that use this approach assemble a host of individual data pieces gathered by contributors like the pieces of a puzzle in order to produce the full picture. Mobile technology is helping to significantly reduce the barriers in collecting data. The ubiquity of smartphones that dispose of high-resolution cameras and GPS sensors theoretically allows scientists to gather all sorts of observational data in essentially real-time.

For example, a researcher at the University of California at Davis, has used an iPhone app to enable drivers to collect data on roadkill. Using the app, concerned citizens can submit the GPS location of any dead squirrel, possum, or other animal they see along the highway into a database (Young 2011b). A similar method was used in bee research. An associate professor of biology at San Francisco State University set up a website in an attempt to find collaborators who would help her with studying pollination. According to the *Chronicle of Higher Education* she "expected to get 5,000 volunteers.

²³ In the MP expense scandal story, the Guardian was thus able to look through 220,000 pages of files within just a few weeks. See Guardian online (2016).

But two weeks after the Web site went online, she had three times that number ready to plant seeds. She ended up sending seeds to as many people as she could: about 25,000.” This, in her opinion, is a powerful demonstration of the fact that there is a community of concerned citizens willing to contribute to scientific research (Laster 2010).²⁴

Digital technology has not only created new forms of data, but has also created a number of new, collaborative approaches to data collection, processing and interpretation. These approaches seem particularly well-suited to addressing some of the complex transdisciplinary research problems that we described as global challenges. Often these will not only require contextual local knowledge, but also adequate sets of local data. Crowdsourcing may well prove to be an efficient form of gathering such data. Connecting people to the processes inherent in conducting research can also help in improving the communication problems we have mentioned before between scientists or academics and the general public.

Digital Scholarship: Peer Review and Academic Blogging

The ‘eBook’ as a tool facilitates note taking and sharing, enables users to search through texts and may feature multimedia content and interactive functionality. The same is true for the mobile devices on which these eBooks are being read. Providing ubiquitous access to information, social networks and a universe of tools for learning and productivity, their superiority to paper notepads is clear (The Horizon Report 2011).

Jeff Jarvis (2007), describing the future of journalism a decade ago, coined a nice phrase for the standard Internet practice of linking to content beyond one’s own: “do what you do best, link to the rest.” Clearly this approach has its roots in academic footnotes. In a sense the Internet itself is made up of footnotes on steroids. Since its invention by academics, the Internet’s commercialization and the enthusiasm of geeks have spawned uncounted new applications of Internet technology. Today the blessings that resulted

²⁴ Harvard’s Division of Social Science, inspired by David Hilbert’s famous list of mathematical problems, took a first step in this direction when it launched a project called “Hard problems in social sciences.” See socialscience.fas.harvard.edu/hardproblems.

from its own invention are slowly making their return to the academy with the wholesale digitalization of scholarship.²⁵

In fact it is when it comes to “disseminating findings” change will potentially be particularly dramatic. Since there is no more marginal cost to publishing, it seems odd for taxpayers to pay for the ‘production’ as well as the ‘consumption’ of academic research. Publicly funded academics conduct the research and write the papers that are then selected by other public-funded academics only to be charged by publishers when they want to access the material thus produced. This argument spawned the “open access” movement and the trend is irreversible. The Directory of Open Access Journals already lists over 10,000 journals.²⁶ Public bodies increasingly require research findings to be published in open access formats.

The traditional model of journal publishing stifles cooperation since researchers jealously guard their insights in fear of being beat to the punch by a colleague. The slowness of the traditional publishing model is another key weaknesses. It usually takes at least several months and often much longer until an article gets published. Yet publishers are fighting a defensive battle in an attempt to protect the subscription model that afforded them healthy margins for decades. Innovative startups like Academia and ResearchGate seek to accelerate this process. With their global digital platforms that bring together millions of users they aspire to rewrite the rules of how researchers collaborate, how research is published and how its value is assessed.

A provocative presentation at a meeting of the Modern Language Association was entitled “Your Twitter followers and Facebook friends won’t read your peer-reviewed article if they have to pay for it, and neither will strangers,” and called for new ways to share scholarly insights (Jaschik 2011). Publishing in journals that are only subscribed to by a very small number of specialists and read by even fewer is a form of “intellectual masturbation”—academics are essentially talking to themselves. The book *Planned*

²⁵ This of course does not mean that meaningful intellectual achievements will no longer be the result of the concentrated work of lonely geniuses. But in today’s research environment lonely geniuses are becoming rarer and even they appreciate the results of collaborative, network-based approaches such as the Public Library of Science (PLOS).

²⁶ Traditional publishers see the danger of becoming superfluous and are beginning to experiment with new online ventures—so far, however, with limited success. The blog posts on the online platform ‘Social Science Space’ initiated by SAGE Publications is an attempt to engage the scientific community online that rarely generates comments.

Obsolescence: Publishing, Technology, and the Future of the Academy (Fitzpatrick 2011) argues that publishing in scientific journals is no longer in keeping with the times and only survives due to its role in job hirings. We agree that “we have to think outside the box that the dissertation is a book or a book-in-progress” (Jaschik 2012). Or as Craig Mod (2011), a pioneer in the area of digital publishing, put it “The future book—the digital book—is no longer an immutable brick. It is ethereal and networked, emerging publicly in fits and starts. An artifact ‘complete’ for only the briefest of moments. Shifting deliberately. Layered with our shared marginalia. And demanding engagement with the promise of community implicit in its form.”

Scholars should not waste time working quietly and secretly on long-winded articles that could later appear in scientific journals. They should rather seek active intellectual exchange with others. Job hiring committees should pay more heed to the contributions candidates have made to the progress of scholarly debate through their comments on the work of others. New metrics track the quality as well as the quantity of contributions of a scholar, as well as through newly configured peer evaluations and data analytics. Assessments could be weighted depending on the standing of the author within the community. There is no reason that traditional editorial policies and peer-review quality assurance mechanisms could not also be replicated online. Surely the entire publication process could be made more efficient, more ‘user-friendly’ and more open. Brown and Adler (2008) point out that the move online “needn’t obviate peer review, but the process could be accelerated to Internet-time speed. Students could watch this process unfold, giving them a much more compelling relationship with their discipline.” The decision-making processes must be clearly documented and the datasets behind the publications should be published as well. Articles that are published this way would not only benefit from the immediacy and transparency of such a process. They would also contribute to the evolutionary nature of knowledge production online (e.g., by posting valuable additional information and allowing for peer commentary). Moreover, once publishing moves to native online formats, authors will be able to make full use of the various advantages afforded by well-established online practices (linking, integrating media, etc.).

The impact on the scientific community will be profound as the methodology of measuring scientific impact and thus status evolves. There will be new forums as well as formats. Entirely new systems may be needed

to evaluate new forms of digitally native scholarship. No material should be judged inferior, if it is identical to traditional work in quality. Given that we assume research and teaching to be equally important activities, we regard the publication of high-quality open educational resources just as valuable as the publication of research findings. Ideally, a publication would serve both purposes at the same time. In any case, tenure decisions should eventually be based not merely on the number of peer-reviewed research articles published, but essentially on the entire scope of scholarly work, be it for teaching or for research.

For example, in today's world, blogging gives anyone the opportunity to publish in a format of his or her choosing, with global reach, at no delay or cost. Common prejudice against this medium needs to be overcome. It is important to realize that a blog is a medium, and like any other medium it can be used for high-minded as well as base purposes. As Dov Jacobs (<https://dovjacobs.com>) has been arguing, it is time to assess the quality of what is being said and not where it is being said.

Understandably, some may not want to blurt out their potentially Nobel Prize winning ideas online in a forum where they may still be attributed to them, but where they do not yet receive the attention of the academic counters that inform promotion and grant application committees. Nevertheless, there surely must be *some* things that would merit public discussion. After all it is the ideas and the feedback they receive when interacting with their colleagues that make academics value being on campus. Not sharing and discussing their ideas with others may work for some, but most academics famously stand on the shoulders of giants (and their peers), so open and frequent communication about—at least some aspects—of their work clearly should be in everyone's interest.

In this sense it is not just that blogging does no harm. In an insightful blog post about blogging in International Law (but the same could be said about any discipline), law professor Jean d'Aspremont (2011: <http://www.ejiltalk.org/in-defense-of-the-hazardous-tool-of-legal-blogging>) describes how the move online has ushered in a veritable culture change: "Nowadays, the fora of our scholarly debates have ceased to rest exclusively with the non-polemical, non-confrontational, aseptic and cozy framework offered by international law journals. Instead, scholarly debates are multifold and ubiquitous. They are taking place everywhere, all the time and in various forms." As he goes on to explain, this change of medium has serious

intellectual consequences, consequences that we regard as most welcome. D'Aspremont observes that:

Scholarly debates have even ceased to be accidental. Differences of opinions are no longer stifled or concealed but they are consciously unearthed. Debating—and the culture of the critique that comes along with it—are now an integral part of the activity of being an international legal scholar. Debate has become an essential component of the production of legal thoughts. Ideas are no longer mulled over for years in an—often dusty and messy—isolated study and kept secret until the day of their solemn revelation through publication in a top-tiered international law journal. While still being the product of a long individual cerebral effort, ideas are now shared, tested and further refined through peer-to-peer experimentation at an earlier stage of the scholarly thought-making process.

It is this culture of sharing, debate and multi-perspectival critique that may help academia to move from 'enlightenment fundamentalism' to the 'New Enlightenment.'²⁷

MOOCs (Massive Open Online Courses) et al.: Asynchronous, Scalable Online Education

The idea that anyone anywhere can be a student has fascinated people since Gustav Langenscheidt first offered distance education in the form of correspondence courses in 1856 (https://en.wikipedia.org/wiki/Gustav_Langenscheidt). Yet next to the potential of the Internet, correspondence courses and what followed routinely disappointed in practice to deliver effective education at scale.

²⁷ It is worth mentioning the 'Flipping the Classroom' paradigm, which as far as we know, was developed by individual primary and secondary teachers in the United States. The basic idea is that students, rather than working through homework by themselves, should receive traditional classroom instruction in video form. This frees up classroom time for individual or group work on solving particular tasks. The idea could end the 'abuse' of professors as recitation machines and allows them to redefine their role in the process of education. ("Flipping the classroom 2011: <http://www.economist.com/node/21529062>; see also Love 2011 and Berrett 2012: www.chronicle.com/article/How-Flipping-the-Classroom/130857).

As university courses move online, we again discuss the potential of the latest technological advancement for students and independent learners of all ages. In the fall of 2011, two teams of Stanford professors launched the first set of open courses that journalists soon began calling Massive Open Online Courses, or MOOCs.²⁸ The MOOC-phenomenon was a global phenomenon from its inception. It promised no less than the “holy grail” of “scale” that had remained elusive for so long in education. With 23,000 students (out of a total of 160,000 who were curious enough to register for the course) passing the final exam of Professor Sebastian Thrun and Peter Norvig’s Artificial Intelligence Class, the two had arguably demonstrated that higher education *can* operate at an unprecedented scale online. Thrun poignantly remarked that they had taught more people Artificial Intelligence (AI) than all other AI-professors in the world combined. Their course and that of Daphne Koller and Andrew Ng together broke the threshold of a quarter of a million students.²⁹

The enormous international successes of these two experimental courses and the media hype that followed can probably be best explained against the backdrop of an ongoing economic malaise with painful cuts to higher education budgets in many countries, and simmering outrage over ever-rising tuition fees in the United States.

Consequently, the pioneers of this movement decided to found two companies, *Udacity*³⁰ and *Coursera*, that now offer hundreds of open courses. While Coursera focuses on providing a platform to several dozen top-tier universities from around the globe, Udacity works with individual instructors and centralizes course production.

Impressed by the unexpected success of these initiatives, Harvard and MIT decided to dedicate \$60 million to a joint venture called edX, which pitches itself as the not-for-profit, open source alternative to Coursera. In the United

²⁸ This designation reappropriated a term originally coined by Stephen Downes (<http://www.downes.ca/me/>), who is thought of as the originator of the term.

²⁹ For an overview of MOOCs development, see Hollands and Tirthali (2014).

³⁰ Udacity—A platform that specifically cooperates with individual teachers and produces the course content in its own studio. Founded by Sebastian Thrun, David Stavens and Mike Sokolsky, financing ca. \$15 million venture capital. Coursera—Platform that enters into basic agreements with leading universities, whose professors in turn produce the course content autonomously and then offer it on the platform. Founded by Daphne Koller, Andrew Ng, financing ca. \$65 million venture capital.

Kingdom, the Open University announced its own initiative in the MOOC space under the brand name FutureLearn. In Spain, a MOOC platform called Miriada X was founded with support from Santander, Telefonica and Universia. In Germany, Berlin-based edtech startup iversity took a bottom-up approach and issued an open call for applications to professors around the globe. The so-called MOOC Production Fellowship in collaboration with the *Stifterverband für die Deutsche Wissenschaft* awarded ten times 25,000 € for the production of innovative online courses.³¹

Analogous to the existing market for academic textbooks, MOOCs provide access to a wide range of high-quality courses from all disciplines in multiple languages to anyone who has Internet access.³² What may be the implications of all of this for the future of higher education? John Hennessy, the president of Stanford University, as well as a computer scientist and a founder of MIPS Computer Systems, summed it up in a form that has been quoted all across the media landscape: “There’s a Tsunami coming” (quoted in Auleta 2012).

Before we go more deeply into what the MOOC phenomenon may mean for higher education, let us quickly clarify what it is that we are talking about by describing the core characteristics of a MOOC.

Creating an open course is not about simply filming 90-minute lectures. It is about creating custom content, designed specifically for online teaching. MOOCs transform traditional course concepts, using multimedia formats, and allow for easy interaction online. Hour-long lectures are broken down into short videos, just a couple of minutes long, which explain individual concepts. These videos allow students to replay, pause or revisit topics whenever they like. After every such sequence, students take short quizzes or submit assignments to check whether they understood what was explained, and to ensure that they stay engaged.

Since learning with and from other students is considered crucial for higher education, peer-to-peer learning is a core component of open online courses. The thousands of students who take this new form of online course can post, browse and answer each others’ questions. Smart mechanisms of information curation, adopted from the consumer tech space such as autosuggest and auto-correct, are used to canalize student queries. Crowd-

³¹ Disclaimer: One of the authors is co-founder of iversity.

³² According to Internet World Stats, there were 3.3 billion people with Internet access in November 2015. See <http://www.internetworldstats.com/stats.htm>.

intelligence mechanisms ensure quality control; by voting for the most helpful responses, students let the best content (e.g. responses to forum questions) to bubble to the top.

This peer-to-peer logic is also applied to assessments. Where multiple-choice questions do not properly evaluate student learning, peer-to-peer grading can be used to provide qualitative feedback. At the end of the course, certificates document students' learning, and show where they rank amongst their peers.

Many people who have been working on e-learning in higher education for a long time have dismissed MOOCs as hype, pointing out that the didactical model is far from revolutionary, and is, in fact, rather traditional. While some of the criticism levelled at MOOC-didactics surely is warranted, the smug dismissal of the phenomenon as “nothing genuinely new” misses the bigger picture. Allegorically speaking, MOOC-critics fail to see the wood for the trees in four ways:

Indisputable Impact on Public Debate

Irrespective of their didactical models and retention rates, MOOCs have undeniably transformed the discourse about the role of technology in higher education. While this was, until very recently, a conversation among domain experts, speculation about the impact of online education on existing institutions of higher education abounds in the opinion columns of quality press. Having placed digitalization at the top of many an institution's agenda, MOOCs have already had a profound impact, the result of which will be felt over coming years.³³

³³ While the issue of technology in higher education has been very much a niche topic, the debate has entered the mainstream. The recently popular book “Die digitale Bildungsrevolution” by Jörg Dräger and Ralph Müller-Eiselt (2015) from the Bertelsmann Foundation, for example, picks up on many of the themes that we have explored here.

Pioneers Cannot be Perfectionists

Counter-intuitively, MOOC-critics have found this emergent format of instruction to be both too traditional as well as too experimental. On the one hand, critics have pointed out that the didactical approaches in use replicate the most traditional elements of classroom instruction. On the other hand, they have howled about the unreliability of peer-to-peer-grading and online assessments. There is an important, common sense rebuttal strangely absent from the debate. Nearly everyone who has produced a MOOC in this first wave of course production did so for the first time, often for little to no money, under very tight schedules. Hence, the results of these efforts have to be judged in context. One of the very important characteristics of any digital learning environment is that it provides ample feedback, not only to students, but also to instructors, regarding course content and platform features. Given the dynamic development of this space, one should expect dramatic improvements in pedagogic effectiveness—not in the coming decades, as has been the timeframe for substantial improvements in traditional higher education, but, in fact, over the course of months.

Completion Rates

A lot of the criticism of MOOCs has focused on their low completion rates. This has been the case from the very beginning of the phenomenon, and the issue will continue to receive a lot of attention as MOOC-providers partner with universities to develop fully online degree programs, and new approaches to blended learning.

Comparing MOOC completion rates to those of standard courses is questionable for a number of reasons. The most obvious of these is that MOOCs, unlike universities, by definition have little to no barrier of entry, and do not require students to make any major commitments in terms of time or money. But there are a number of additional, somewhat subtler points to be made here.³⁴

³⁴ Many of these are discussed at The Augmented Trader (<https://augmentedtrader.com/2013/01/06/about-mooc-completion-rates-the-importance-of-investment>).

In terms of Internet engagement, MOOC completion rates can be considered phenomenal successes, since there are not very many intellectually demanding “products” online that succeed in luring back users over the course of many weeks.

- Completion rates for university courses often do not include students who enroll in a course, then withdraw early from it, or decide to audit it.
- Failing a university course has real-life consequences and can be expensive monetarily, or by “staining” one’s transcript with a “fail” or incomplete grade.
- Low barriers to entry lead to higher enrollments, stemming from student curiosity. While a lot of the students may have no intention of completing the class, should we not welcome the fact that MOOCs give students the opportunity to explore the *globus intellectualis*?
- Students who demonstrate at least some effort are much more likely to finish a course than the “average” student. The same is true for those who have “skin in the game,” because they have paid a fee for an authenticated certification.

To address the concerns about low completion rates, Coursera released figures that support some of the arguments made above. The most important finding cited was indeed that many “students” sign up for a MOOC without the intention to complete the course. This interpretation is supported by the fact that the completion rates among students who attempt the first assignment is relatively high, at 45%. In the so-called signature track program, where students pay a modest fee for identity verification, completion rates are even higher, at a respectable 70% (Kolowich 2013). Edtech’s industry poster-child 2U program suggests a retention rate of 83% across all of its programs since launch (<https://2u.com>). Similarly A.S.U. Online, the degree granting online Program of Arizona State university reports a retention rate of almost nine in 10 students that pay tuition fees (Lewin 2015).

Admittedly, it is too early to make sweeping assertions for or against MOOCs based on these pass rates. What is clear, however, is that keeping the barrier to entry low provides access to the greatest possible number of potential students, and enables them to sample as many courses as they like. Fees for identity verification through online or offline proctoring ensure sustainability, and significantly improve completion rates. Beyond

that any argument based on completion rates requires nuanced differentiation.³⁵

Cost and Quality: Two Sides of the Same Coin

In the United States, the MOOC phenomenon has to be seen in context of the heated debate over ever-rising tuition fees, the so-called *cost crisis in higher education*. MOOCs were seen as a promising solution to this pressing problem, as they seemed to allow a reduction of the per-student cost of instruction.

In Europe, the situation was different where the hope was that they would allow universities to address what could be described as the *quality crisis in higher education*. Since student pay no or very little tuition, the rising cost of higher education did not play as prominent a role in public debate. Yet, most European states have not increased the budgets for teaching in line with the growing number of student, which led to a creeping deterioration of quality. Student-to-faculty ratios have been rising continuously since the onset of mass higher education in the sixties. So while in abstract, higher education has not become less affordable for the individual, resources are spread more thinly. Whoever cares to take a look will see evidence of deplorable conditions: decaying physical infrastructure, limited access to library resources and overextended faculty and staff that do not see students as talent to be nurtured, but as burdens to be managed.

Until now, the relationship between the number of students and the quality of teaching could be described as an axiomatic law: the higher the number of students, the lower the quality of a course. There is a small caveat to this relationship. For the first couple of students, a course benefits from a more diverse set of opinions. But after the supposedly ideal number of roughly a dozen students is reached, the perceived quality of traditional classes quickly deteriorates. Not every question is answered. Not every point can be made.

³⁵ When the first numbers pertaining to the collaboration between Udacity and San Jose State University to provide fully online instruction were released, they raised a lot of eyebrows. Pass rates for enrolled students “ranged from 29 percent to 51 percent.” It should also be noted that “the student taking the course had already failed the traditional version once” (Kolowich July 19, 2013).

In the context of online education, however, the marginal impact on quality of additional students is, by and large, positive. All students have access to the same material irrespective of the number of the people enrolled. Put in the ascetic terms of economics, consumption is non-rivalrous. In the early 19th century, Jefferson expressed this idea in metaphorical terms, stating, “He who receives an idea from me, receives instruction himself without lessening mine; as he who lights his taper at mine, receives light without darkening me” (http://press-pubs.uchicago.edu/founders/documents/at_8_8s12.html).

Numbers and quality might in fact even be positively correlated. One reason for this is that the increase in diversity (in terms of cultural or disciplinary background, age, gender, race and work experience) in the course makes for a livelier, and, possibly, also more educationally fruitful debate. The best students are typically the most active contributors and the points they raise and the answers they give become teaching resources in their own right. The higher their number in absolute terms, the more high quality content is generated within a course. The combination of peer-review, sorting and filters allows to identify quality in quantity.

Online as well as classroom instruction have specific strengths and weaknesses. Online teaching should not attempt to mimic classroom instruction. Instead, online instructional design should start out with the question of which limitations of classroom instruction do not exist in the online format. Its strengths include independence of time and location, interactivity, iterative improvement on the basis of rich empirical data, adaptivity, responsiveness and student diversity. Taking advantage of these strengths allows for new instructional formats, which previously would never have been possible. Understood in this way, online education is not just about cutting costs, but also creates new dimensions of quality. This is especially important in the context of mass higher education, where student diversity, despite the large number of students, is often limited. In this context, online education may offer enriching experiences with cultural diversity, as students encounter their peers from around the world online.

What Ultimately Matters: The System Finally Moved Beyond E-learning

Beyond the impact outlined above MOOCs have served as a rich laboratory for didactical experiments. Unlike most e-learning solutions that were merely content delivery engines not much different from textbooks, the new wave of online education players understands learning as an active, social process. MOOCs and other new forms of online education are providing content and designing a learning process (Kamenetz 2009).

State-of-the-art pedagogy combines the attributes of highly addictive media experiences such as movies and TV-series, gaming and social networks: It is emotional, interactive and social. It combines story-telling techniques that create immersion and personal identification with participatory pedagogy that requires an active engagement of learners through challenging assignments embedded in a community of peers and mutual feedback. Students acquire knowledge in order to understand a certain topic, but then need to apply it in different contexts, actively creating their own pieces of work while analyzing and evaluating the work of others.

Using this approach allows us to teach things online that are often thought of as being hard to teach in a digital format – namely courses on topics where there are no dichotomous right or wrong answers. No black or white, but rather a lot different shades of grey. Where people have to come together to negotiate truth, stating not just their position but also the facts and arguments that let them arrive at a particular conclusion. In short exactly what is at the core of teaching the New Enlightenment.

Consider one example: a course on leadership. This is one of the “soft” or “human” topics that supposedly can only be taught well in a face-to-face environment. In traditional e-learning one would for example watch a video of two people fighting in the hallway and then be prompted to respond to a couple of multiple choice questions that require the user to choose a course of action. However, knowing what is the right thing to do and actually doing it, are of course two fundamentally different things. The way we envision online education, what would happen after the video, is that students are prompted to use the camera of their device to formulate and record an original response to the characters in the conflict situation in form of a video comment. Such assignments allow students to respond in an infinite number of ways to a complex problem and require them to move from multiple

choice to infinite choice. Aggregating the user-generated content into a stream and letting everyone in a given courses give detailed feedback to each other takes this one step further.

It is approaches such as these that emerge out of the experimentation with active, social learning online that we believe will enable us to teach New Enlightenment thinking on a global scale.

The Long-term Impact of MOOCs

In the debate about the long-term impact of MOOCs, one poignant analogy that was drawn is that MOOCs are higher education's iTunes moment.³⁶ While this is a very catchy metaphor, it falls short of capturing the depth of transformation in the field of higher education. When iTunes disrupted the music industry, it disrupted its distribution channel. The product itself remained unaffected. A song sounded the same on MP3 as it did on CD. This is decidedly not the case with MOOCs, since these are by definition more than just filmed lectures. Professionally produced content more often than not eclipses the quality of traditional lectures, and the advantages with being able to learn at one's own pace is obvious. Aside from the interactivity of online lectures with frequent quizzes to ensure engagement, active and diverse online communities (in terms of disciplinary and cultural background, age and work experience) can provide especially rich social learning ecosystems. Thus MOOCs can function as effective and efficient teaching formats, as well as laboratories for teaching innovation that thrive on the diversity of perspectives among the multitudes of participants. In other words, online courses are not just another distribution channel for the kind of higher education we know. Digitalization enables us to design wholly new formats of teaching and learning that, in some cases, will be superior to current practice.

One way to understand the coming digital revolution in higher education is to look at its profound impact on students, faculty, and institutions of higher education.

³⁶ This refers to the way Apple has refashioned the distribution model of the formerly all-powerful music industry with the iTunes platform. This was pointed out, for example, by Clay Shirky's personal blog: "Napster, Udacity, and the Academy" (2013). This resulted in a lively debate (Bady (2012, 2013)).

Students

In the digital era, students will access, collect, organize, evaluate, combine, edit, publish, share and comment on information in ways that are not only faster and more convenient, but also allow for wholly new forms of interaction with content as well as their instructors and their peers. Teaching materials will be interactive and social. Digital learning environments evaluate the learning process in real-time, ensure engagement and adapt content to students' needs. Students will have access to best online courses from around the world. Students will not learn alongside one another, but even more than in the past with and from each other. Online social networks, mentoring and peer-to-peer learning will be core components of online teaching and learning.

Faculty

Online education enables faculty members to teach more people than would ever have been possible in traditional lecture halls. Like publishing research papers or writing textbooks, online courses are lasting achievements that can build academic reputations and for some will be very lucrative. Teaching by and large has not been subject to the kind of professional scrutiny of peer-review that is standard practice when it comes to faculty research. With online courses, however, a rigorous quality assurance regime seems inevitable.

In their day-to-day teaching, professors are likely to increasingly assume the roles of facilitators or guides. Faculty will have to help students navigate the wealth of online offerings at their disposal and develop new formats that supplement online instruction. As students gain access to diverse teaching resources, they will become more autonomous learners. This gives professors the opportunity to focus on raising and discussing the epistemological questions that arise as students begin to apply basic theories to a given problem. So as the "input" aspect of teaching is digitalized, instructors should be freed from repetitive tasks, enabling them to devote more time to mentoring and giving individualized support. The objective of a digital agenda for teaching should be to make learning both more efficient and more effective, to reorient face-to-face teaching towards the contextualization of knowledge that cannot easily be automated (e.g. providing historical context,

demonstrating the limitations of theories, discussing complex real-world case studies, etc.). Educational analytics should enable faculty to analyze student performance and development in detail, and thus will allow them to provide individualized feedback.

Institutions of Higher Education

The issues raised by online education (global access, portability of credits, analytics and empirically-based quality assurance) have set the agenda for higher education for years to come. Experimenting with MOOCs allows institutions to showcase their best teachers and to recruit students from around the globe. Experimenting with online teaching enables institutions to gain first-hand experience with new digital teaching formats. In this context, the freedom from administrative shackles that enables faculty to rethink education in a digital context, independent of the confines of accreditation requirements, leads to innovative approaches that will later benefit students in online degree programs, as well as on campus. The same is true for educational analytics. The sheer amount of data gathered enable faculty and institutions to learn a lot about learning.

All of this poses a fundamental challenge to standard practices at mass universities (see Twigg 2003 and Bowen, Chingos, Lack, and Nygren 2012). Online education allows for digitally networked, cross-institutional teaching and learning. Teaching becomes more flexible, less confined to rigid, centrally organized classes that last a full semester, with more modularized modes of instruction that can be flexibly combined. One notable example of this type of approach is Minerva (<https://www.minerva.kgi.edu>), an institution that combines virtual classrooms with local hubs. Students rotate from one major global city to the next attending classes fully online. On the other hand, it is also conceivable that MOOC-platform providers will become global brands that establish local branches or franchises that offer digital learning programs supplemented with classroom discussions and mentoring. What seems clear is that many institutions will take advantage of these new possibilities, combining what is known to work offline with what has suddenly become possible online. These pioneers will soon provide a formidable challenge to the status quo.

Summary

All stakeholders should ask themselves what they could and should do differently, rather than passively observe the unfolding of events. They should experiment and explore the opportunities. The careful analysis of granular meta-data through educational analytics will allow for empirically based, iterative improvement. In this context, it is important to note that data protection is important, but should not be approached in a way that strangles innovation.

Experimenting with online education should by no means be limited to the production of learning resources. Universities should also experiment with the integration of existing online courses into their curricula, for example. Analogous to the textbook market some institutions may license high-quality gateway courses. On the other hand, niche disciplines with limited resources could collaborate across institutional boundaries to create new courses and networked degree programs. Universities, companies and even entire countries can use MOOCs for talent acquisition and recruiting. Established universities should take a close look at how the innovative projects currently under way evolve in order to identify new opportunities to structure teaching and learning in the digital age.

If online education thus allows us to strike a new balance between access and quality in higher education, the fact that change is possible turns into a moral imperative. Even if student numbers were to recede in the long-term due to demographic change this is no excuse for inaction. New forms of instruction—fully online as well as blended—can help to increase current capacity in systems of higher education that are in many cases bursting at their seams. Therefore they are far from a “nice to have” but can help to solve urgent problems—even if these problems may be different in different contexts.

CHAPTER II

THE UNIVERSITY IN THE DIGITAL AGE

When we consider the technological advances of the last decade—e.g. HD-online video, user-friendly websites, APIs, mobile devices etc.—it becomes clear that these advances, based on Murphy’s Law and the scientific and technical breakthroughs in so many other areas, did not develop in a linear but rather in an exponential way and are set to continue to do so.

As stressed before the alternative to new digital formats for many people around the world is not having access to any form of higher education at all. In light of humanity’s scandalous inability to offer egalitarian access to educational opportunities (a problem that is far from solved even in most developed nations), we cannot afford to err on the side of caution when it comes to promising experiments that aim to significantly expand access.

Some argue that online education may do to institutionalized higher education what Wikipedia has done to printed encyclopedias. Some technology enthusiasts even question the need for institutions in general, arguing that the job of education is better left to “social ecosystems” and “online communities” instead of traditional institutions. Yet, we doubt that people who were given the time-equivalent of a B.A. degree to home-school themselves would readily succeed in building an educational and social environment from scratch that is as rich as that of a university (not least since all that is available online does *also* supplement the campus experience). To most students, this would seem more like a daunting challenge, than a liberating experience of exercising their personal freedom.

This is not to say that the notion of what it means to be a student will not be subject to change. If nothing else, the flood of quality content online, oftentimes user-generated, is an impressive validation of the constructionist theory of learning, which states that people learn well by working on

something they care about. We should remember that the entire Internet after all was largely built by autodidacts. In contrast to the fight against illiteracy, for example, the formal educational system barely played a role in this leap in human evolution!

The process of learning about something online typically is a mix of meddling, consulting resources written as “digital community service” by people who already figured out how to do it and mediated peer advice (message-boards, chat rooms, instant messaging services). As Seymour Papert (1980) claimed almost 40 years ago, this way of learning is the opposite of the ways we teach.

Yet, while any haughtiness seems ill-advised, we believe that physical institutions in principle are here to stay. Not least the whole character formation aspect, which makes up an important part of the value of a university education, is regularly forgotten in the accounts of higher education’s technophile critics (Bischke and Shah 2011). Even at the less than prestigious universities—where ‘personal enrichment’ might not be a priority—students profit immensely from being part of a university community. It is during those years in college that their values and their mindset are being shaped and that they build personal as well as professional networks. It is important to realize that for these students the alternative to a B.A. program would typically be spending the best years of their youth working in a—more often than not—comparatively dull environment, rather than the—for all its shortcomings—socially and intellectually vibrant atmosphere of a university campus. Of course there are bad institutions of higher learning and companies with a great deal to offer, but these are the exceptions. The university as a social institution, as a community, as a hub of research activity and—not least—as a branded place with signature buildings will survive.

Even if it will not do away with institutions, we believe that the wealth of new learning resources that is currently being created will lead to a Renaissance of informal, autonomous and peer-to-peer models of education. Ultimately, this development may, indeed, transform what we mean when we speak of ‘higher education’ at a ‘university’ and in that sense the technophile critics of today’s institution may ultimately prove to have been on the right side of history.

In 1987, Arthur W. Chickering and Zelda F. Gamson (1987) remarked in their *Seven Principles for Good Practice in Undergraduate Education*, “Learning

is not a spectator sport. Students do not learn much just sitting in classes listening to teachers, memorizing pre-packaged assignments, and spitting out answers. They must talk about what they are learning, write reflectively about it, relate it to past experiences, and apply it to their daily lives. They must make what they learn part of themselves” (Chickering and Gamson 1987). Peer-collaboration in hands-on projects that is meant to demonstrate that in “the contentious, messy, contingent, constantly changing world of the practical, unlike that of the theoretical, no one is an expert and, while there are those with a vast range of experience, no one has the answers.” This is exactly the kind of *complex multi-perspectivity*—yes, even the modesty or humility—that the real-world seminars we are would like to see become part undergraduate education are meant to achieve. As Elizabeth Coleman, former President of Bennington College, points out, this form of teaching has to look beyond “the traditional format of the fourteen-week class. ... Instead of the grid with its blocks of times and spaces, imagine something more akin to a medieval fair—lots going on, in a variety of formats, and all of it tempting” (Coleman 2007).

What seems certain is that even if this type of education could somehow be accommodated by the conventional university structure, bringing professionally, culturally and philosophically diverse expertise to campus and allowing for intensive student interaction, this would require substantial additional resources. Thus, if this form of education is to take root beyond an elite circle (which we think it should), intelligent use of digital media will be a *conditio sine qua non* to make it scale.

As open educational resources of all stripes become increasingly available online, the wealth of educational opportunities available to future student generations increases exponentially. Crowdsourcing (which applies to institutions as much as it does to individuals) will not only produce ever-more content, but will also help to separate the wheat from the chaff. Online any high quality teaching resource has the potential to “go viral.” Large numbers of people interacting with content (rating it, discussing it, sharing it with others) as well as statistics such as pass rates will identify the material that works best for learners. By virtue of this mechanism top teachers will soon receive more recognition than just their department’s teaching award.

Education-as-a-Service

Much like there has been a massive shift in the world of software from software that was bought and implemented on-premise towards what is called software-as-a-service (SaaS) i.e. delivered over the Internet and used in a browser window from anywhere in the world, we observe the emergence of Education-as-a-Service.

Universities, however, find it very challenging to make this shift by themselves. That's why they increasingly turn to companies to help them bring their programs online. Paul LeBlanc, President of Southern New Hampshire University and a pioneer in this space, identifies three primary reasons for this:

- “They have tried to launch online programs and had limited success, or they have never done an online program, so they know there is a lot they do not know;
- They do not have the internal capacity, whether it be the right people (often the case), technology, systems, data analytics, or processes;
- They do not have the financial resources to build capacity and support a necessary marketing effort.”

LeBlanc goes on to raise important questions about the legitimacy of public-private partnerships in this space and warns of another wave of private enterprises that feed off of taxpayer money. Our view, however, is that given the lack of institutional capacity in the public and non-profit sector (and not just the funding!), it is difficult to imagine the digital transformation of higher education without private sector involvement. That being said this space should be regulated and monitored to avoid the kind of abuses we have seen in the private for-profit college industry (LeBlanc 2013).

The Final Frontier: A Common Market for Academic Credits

Kevin Carey (2015) from the New America Foundation believes that “[t]he failure of MOOCs to disrupt higher education has nothing to do with the quality of the courses themselves, ... What they don't offer are official college degrees, the kind that can get you a job. And that, it turns out, is mostly what college students are paying for.” If colleges don't become more flexible, he argues, students may soon migrate to open credentialing systems that

provide exponentially more and, more importantly, more relevant information and therefore will rapidly gain currency with employers. In his view this will allow students to acquire skills and get jobs for a fraction of what colleges cost today.

One such initiative aimed at providing a more flexible option to access traditional college is the Global Freshman Academy by edX. Courses are fully online and cost \$45 a course for an identity-verified certificate and \$200 per credit. Altogether, eight courses and a year of credit will cost less than \$6,000 – significantly below what students or taxpayers normally pay for education at this level of quality. All of this leads Jamie P. Merisotis, president of the Lumina Foundation, to conclude: “The monopoly that used to exist in terms of how higher ed is done is over [...]” (quoted in Lewin 2015).

A key issue for these new initiatives to have transformative impact, however, is the portability of credit. Much as suggested by the etymological root of the word itself, for credit to gain currency, there needs to be both: institution that issues it and institutions that accept it. This brings us to the issue of transfer credit.

To fully realize the potential of online education, transferring academic credit will have to become a lot easier. Today, it is typically a long and arduous process until credit earned at one institution shows up in one’s academic transcript at another. Transfer credit usually requires an academic officer of one’s home institution to assess the credit-worthiness of the coursework performed elsewhere. Credit is awarded on a case-by-case basis, depending on whether it meets the student’s specific degree requirements. Differences in academic policies, curricula, and credit requirements make it difficult to confirm the comparability of coursework. The complexity of the process, as well as the fact that the transferability of credit is by no means guaranteed, significantly curtail the practical relevance of this otherwise promising concept.

In the United States, there is no universal model that regulates the transfer of credits from one institution to another. Different states have different policies that range from ad-hoc decisions by the respective institutions to formal inter-institutional agreements to state-mandated policies that require colleges and universities to follow certain guidelines. An important report by the New America Foundation entitled “State U Online” (Fishman 2013) provides a systematic analysis of the various state efforts that aim to ease the

transferability of credits.³⁷ None of the approaches presented in the report, however, is simple and comprehensive. As the digital future of higher education appears on the horizon, the report thus calls for new efforts to tackle the issue of transfer credit:

Residency requirements will soon make little sense, as students, even those attending residential colleges, want the flexibility to take online courses wherever and whenever they want. ... The proliferation of new and better technology infrastructure and the explosion of Open Education Resources can help students get to a credential more efficiently using online education, but only if higher-education institutions work together to share their resources and reduce the barriers that prevent students from moving seamlessly from institution to institution in the virtual space (Fishman 2013).

This statement points in the direction of a very important avenue for future development. Full-fledged online degree programs have been around for years. With the emergence of MOOCs as offerings at the level of individual courses a “global market” for academic credit may finally emerge.

As is usually the case in the digital sphere, the United States has a head start in terms of technology and deployed capital. But in this case the Bologna process may somewhat accidentally provide Europe with a distinct regulatory advantage. It is sometimes said that the one thing one needs to know about the US system of higher education is that it is not a system. It is an assortment of over 4,000 individual institutions that meet some common requirements of regional accreditation bodies, but otherwise lack a common academic framework. Credit transfer is common, but happens on an ad-hoc basis.

³⁷ The report identifies five different strategies employed by different states or groups of states: Clearinghouse (“search portal to find the online courses and degree programs”), Shared Contracts (“state institutions join together to purchase shared contracts for resources like a Learning Management System”), Shared Student Services (“a variety of online student-support services at all institutions within the system”), Shared and Articulated Credentials (“fully articulated efforts that include easy transfer of credit among institutions and shared credentialing”), Shared Credentials Beyond State Borders (“take all the components of previous steps, and allow students to move freely beyond state borders”). For details, Fishman (2013).

The regulatory environment in Europe is markedly different. The harmonization achieved in the context of the European Credit Transfer System (ECTS)—which originally was conceived as a primarily political and economic project—could prove unexpectedly fruitful in promoting the digitalization of European higher education. The original intent of the Bologna Accords that created the European Higher Education Area was to promote the mobility of students within Europe. The idea was that students (and faculty) should be able to move freely and effortlessly between European institutions of higher education. The legal and institutional basis established to allow for this mobility may in fact reach its objective. But the way this will be achieved most likely will be the reverse of the mechanism originally intended. Yes, European students and professors will move freely between European universities. But more importantly, European universities will come to the students by offering courses online.

One way to process this would be for students to enroll as visiting students at another institution, passing exams either at the institution offering the course, their home institution, online or in an independent test center. Another possible arrangement is for online education companies to become franchising partners of existing institutions of higher education. In this framework, the corporate or non-profit partner of a university licenses courses or entire study programs, sometimes even borrowing faculty for offline instruction. Translated into an online-format, this is very similar to the kind of digital enabled non-profit /for profit partnership pioneered by 2U and others.³⁸ A third way to approach the topic might be to collaborate with existing bodies in charge of professional training and executive education.

When it comes to the issue of credit recognition, the so-called “Convention on the Recognition of Qualifications concerning Higher Education in the European Region,” or “Lisbon Convention” applies. Included in this framework agreement is an article that deals with the recognition of credits, which has wide-ranging implications. It states verbatim: “The responsibility to demonstrate that an application does not fulfill the relevant requirements lies with the body undertaking the assessment.” What this means is that, unlike in the United States, where students have to demonstrate that their credits are eligible for transfer, the ECTS places the burden of proof on the

³⁸ There is no literature on this in the context of MOOCs yet, but the existing literature on franchising gives a good indication of how this may work. See Leusing 2012.

universities. Universities *have* to accept transfer credit *by default*. Any refusal to accept ECTS credits from other accredited institutions must be justified. Additional provisions strengthen the student's position *vis à vis* the institution. For example, universities are not allowed to formulate specific requirements for credit recognition. Transferring credit may not create additional work for students. For example students cannot be mandated to retake exams. Moreover, the convention explicitly grants students the right to bring legal proceedings against non-compliant institutions.

This legal framework *de jure* creates a common market for university credits within the European Higher Education Area. While the *de facto* implementation of the Lisbon Convention still leaves many things to be desired, the opportunities for online education are clear. It provides a clear incentive to new players to enter the emergent market for online higher education. Whereas higher education is largely government-owned and operated, the higher education ecosystem of the future will most likely feature a much more diverse set of actors. These actors will range from universities as we know them today, to loose alliances of functionally highly differentiated service providers that fulfill different aspects of higher education (content input, discussion and contextualization, examination, correction, certification, quality control etc.), to corporations offering highly specialized training. Licensing agreements, grants, co-payer schemes and voucher systems are some of the arrangement that could replace direct state provision. In other words, higher education could be repositioned on the broad spectrum of public/private partnerships from a design-build-operate model to some sort of contractual or concession model (Gerhard and Dreye 2006). Designing policies that ensure diversity, quality and universal access in this emergent market for academic credit will be one of the political challenges that result from the fundamental structural shift in the higher education landscape as a consequence of digitalization.

Redesigning Teaching Practices

In a far-sighted article that appeared in *Educause Review* in 2003, Carol A. Twigg, President and CEO of the National Center for Academic Transformation (NCAT), gives a description of the status quo that unfortunately has lost little of its accuracy:

Currently in higher education, both on campus and online, we individualize faculty practice (that is, we allow individual faculty members great latitude in course development and delivery) and standardize the student learning experience (that is, we treat all students in a course as if their learning needs, interests, and abilities were the same). Instead, we need to do just the opposite: individualize student learning and standardize faculty practice. But with its connotations of words like regulate, regiment, and homogenize, the word standardize does not precisely capture what is required. What higher education needs is greater consistency in academic practice that builds on accumulated knowledge about improving quality and reducing costs. (Twigg 2003)

The lively debate on quality management in higher education at least has begun to put “teaching quality” on the institutional agenda. The next step would be, however, to really rethink existing practice in a more radical way.

Higher education today is very much supply-driven. The courses available at an institution are a function of the knowledge and skills of the faculty on campus. Thanks to technology it may become more demand-driven as people register interest for a given topic. For example, faculty and students could collectively write the syllabi of advanced seminars starting with the open questions the students would like to address. Once fleshed out they could invite experts from around the globe to cover individual sessions in ad-hoc arrangements. As these questions will typically cross disciplinary boundaries, such courses would have to be team-taught so as to draw on the insights of academics from different fields.

Online ‘private instruction’ will become the norm, rather than an elitist exception. As pointed out above, simulations and game-based learning environments allow for wholly new forms of instruction and assessment. Complex analytics that evaluate learner interaction with teaching resources in real-time will make the interventions of educators much more targeted and thus effective. Moreover, our improved ability to track student progress will allow for degree requirements to become more flexible. Instead of defining a degree by credit hours, many degrees will be awarded for demonstrated competency—irrespective of coursework completed. Taken together, these innovations amount to a profound transformation.³⁹

³⁹ It appears that professional schools, which have already integrated capstone projects and professional experience into their curricula, may be the first to move away from credit-hours, exams, papers and degrees to formative assessment and certified portfolios.

Once new forms of teaching are firmly established, the time resources freed-up by automated or digitally supported forms of instruction and assessment can be devoted to what technology advocates and skeptics alike deem to be most important: individual attention. Today, being forced to recite introductory material and grade an endless stream of tests, professors generally do not find the time to share exactly the kind of insights and judgments with their students that are not readily available in books or online. We believe that a teacher that can be automated, should be. Not to get rid of them, but to focus their attention on discussing value questions, on meaningful assessment that goes beyond standardized tests and on what can be summed up by the word ‘mentorship’—i.e., tutoring, nurturing conversations and personal advice.

With intellectually intimate knowledge of their students—based not least on online profiles that include their academic interests—professors could become analytics-supported curators of their students’ academic portfolios. Teaching would shift from content centrality to student centrality. The professor’s new role would be not so much that of a foreign correspondent functioning as an intellectual broadcasting service, informing students about what is going on in the far-off distant lands of research, but that of an individual travel guide or ‘intellectual GPS’ that helps students to navigate the academic landscape, constantly encouraging them to go and see for themselves. In order to make all of this more likely, just as we recommended with curricular innovation, promotion committees should also take into account faculty time invested in the redesign of an institution’s teaching and learning experience. Ideally the two would go hand in hand and new curricula would be taught through a set of reconceptualized teaching formats.

While most faculty may not see things that way, we believe that if technology is deployed with the mindset of an educator, instead of that of an accountant, it can help to make education more, rather than less, ‘humane.’ Unfortunately faculty attitudes are frequently named as the single most important barrier to adoption of technology. Brown and Adler (2008) summarize the problem as follows: “New paradigms cause dislocation, disruption, confusion, uncertainty. They are nearly always received with

The Humboldt–Viadrina School of Governance in Berlin, Germany seems to be taking some interesting steps in this direction.

coolness or hostility. Vested interests fight change. And leaders of old paradigms are often the last to embrace the new.”

Michael Staton, founder of an education start-up turned investor experienced this coolness and hostility first hand. In his experience, the percentage share of faculty who embrace the new opportunities afforded by technology is “incredibly, incredibly small, probably less than 5%.” In fact, when his company Inigral, since renamed Uversity, introduced so-called ‘course-walls’ at Arizona State University, a feature that allowed students to publicly communicate with their classmates online, the company soon faced a revolt of the faculty members. Staton recounts that faculty saw peer-to-peer communication as “one more thing they had to manage” and forced them to remove the feature after two weeks, in spite of the fact that it had been enthusiastically adopted by students. The company was not given the opportunity to explain the benefits that result from peer-to-peer dialogue. Apparently the rules that Cornfeld (1908) put down in his *Microcosmographia Academica*, are still true more than a 100 years later. From his experience working with several dozens of universities Staton concluded: “Convincing older people to change their ways is not a business you want to be in.”⁴⁰

While these observations may be dismissed as anecdotal, there is in fact data to back up his claims. The ‘WCET–campus computing project’ also finds that the major challenges when it comes to introducing online education are internal, not external (e.g., financial). While budget cuts and the lack of key resources are still a major concern, the most frequently listed factor hindering the transition to online or hybrid education is faculty resistance.⁴¹ An op-ed in the *Washington Post* summarized the issue in blunt terms: “Professors hate online education” (Lucas 2016). There is concern that the drive toward online education might unduly increase faculty workload and may compromise quality (Kolowich, 2010b). Part of the problem is that technology solutions that do not do either of the two may exist, but rarely see widespread adoption, as “colleges are reluctant to adopt solutions that did not arise from their own campuses” (Fischman, 2011b).

So in order to begin to reap the benefits that result from the imaginative use of technology, faculty need to be assured that in this new setup:

⁴⁰ All quotations: Interview Michael Staton, 5 April 2011.

⁴¹ More than 70% of institutions surveyed said that teachers created the biggest roadblock to change (Campus Computing Project 2010, 5).

- a) they will still have a role to play;
- b) they will not have to work more, but the work they will be doing more of will actually require their advanced knowledge and skills and that better employs their experience and technical capabilities in conceiving and selecting teaching materials as well as in offering personalized advice;
- c) they will not have the feeling that the overall quality of instruction will be lowered by using technology, but rather improved.

From Campus to Network

Why is it then that students should still ‘choose a university’? Why, in a networked world, “should a student have to assign his or her ‘enrollment’ to a given institution, akin to declaring loyalty to some feudal fiefdom?” (Brown and Adler 2008). Some argue that when it comes to teaching there may in fact be—like for many businesses—substantial benefits from specialization. For example, Statistics.com enrolls about 2,500 students per year. According to Peter Bruce, the company’s founder and president, it is looking to expand its introductory offerings so as to compete with “any university, whether online or brick-and-mortar, that is going after the nontraditional student market” (quoted in Kolowich 2010d). In his view, specialized “[o]rganizations that provide the ‘best’ online education in a given subject area will come to dominate others.” For universities that see higher education merely as training, such offerings in combination with the certification of competency could indeed amount to a formidable challenge.

For example, non-profit or for-profit entities could be set up as academic assessment centers that gauge autodidacts’ analytical skills, mindset and personality, network, teamwork experience and a specific portfolio of project work so as to provide degree-equivalent certification. Language testing through IELTS and TOEFL has shown that this kind of certification can become a globally recognized standard. In the area of professional development there clearly is a market niche for this kind of competency-based assessment. In a sense this could be a dislocated 21st-century version of the guild system. An online platform like LinkedIn that enables managers and employees to provide references for (former) colleagues and

customers could help to reduce information asymmetry in the job market even further.⁴²

So will we soon see a disaggregation of the different functions of higher education (admission, teaching, examination, certification) as Wiley and Hilton (2009) proclaim?⁴³ We believe no. While there may be good reasons for radical change, the inertia of social processes is such that universities will remain crucially important for the foreseeable future. In fact, when it comes to their certification function, universities probably have not yet reached the height of their influence. Degrees and educational brand names still serve an important signaling function as they significantly lower transaction costs. With increasing labor mobility due to globalization, the value of universally recognized qualifications increases. Thus, for the time being universities will thrive, in spite of the fact that their curricula are inadequate and their pedagogy is outdated.

The real question, however, is of course what will happen in the long run. As pointed out above we do not see hyper-individualized online education replacing the ‘college experience.’ Nor do we think that it should. As described in earlier chapters, the education of concerned citizens, apart from training in one or two disciplines, requires an intensive, communal engagement with real-world challenges. Sustaining such a prolonged and serious effort may, indeed, require students to be part of a formalized community. Furthermore, we acknowledge the *power of place*. While in theory people could learn and ‘meet’ online, we believe that some notion of the ‘campus’ will translate into the digital era. Much as cities have survived repeated predictions of their imminent demise as a consequence of technological innovation (due to the telegraph, the telephone, the car, the Internet, etc.), universities campuses are here to stay. Yet, just as modern metropolises look very different from medieval cities, so too will universities be characterized by a more fluid, dispersed nature. The spatial organization of the university will have to change since the goals of the university are closely tied to what

⁴² Start-ups, that experiment with these kinds of ideas, are BraveNewTalent, CubeDuel, and Honestly.

⁴³ Under the heading ‘Monopoly No More’ Wiley and Hilton (2009) maintain that: “higher education’s historic monopoly is being challenged in each of its major functional areas: structuring and providing access to content, tutoring and learning support services, curating and providing access to research materials, acting as a hub for social activities, and awarding degrees and other credentials”.

Newman and others called the *Genius Loci*. Sheldon Rothblatt (1997) dedicated a chapter of his book, *The Modern University and its Discontents: The Fate of Newman's Legacies in Britain and America*, to this theme. In view of an evaluation of the use of space in Oxford and Cambridge, as well as his analysis on developments in Great Britain and the United States, Rothblatt emphasizes the decisive role played by the spaces in which professors and students live together and work. Classrooms in the future have to be designed for dialogue, with discussion, questioning and group-work in mind. For the interaction between tutors and students, as well as that between students among themselves, space will have to be conceived for personal conversation. A good portion of independent learning will take place online. These practical problems will need to be addressed.

Online social networks will create communities that (as with current areas of research) will not be tied to any *one* place. They will exist in a state of flux as scattered institutions that appear in different forms in different places and settings. Students and professors will (selectively) share information about what they are reading, whom they are meeting, which conferences they are attending and what they think about academic or current affairs, etc. This information will be aggregated into personal, institutional, topic- or discipline-specific newsfeeds that can be granularly configured. Ideas for academic, civic, entrepreneurial or extracurricular projects can be pitched to the community or globally for review, feedback or as open calls for participation. So as to enable ad-hoc coalitions to take action on these initiatives, the “logistics of true collaboration” should form a cornerstone of such platforms (Brown and Adler 2008).

These institutional online networks will serve as comprehensive transmission belts for information within the academy and the world beyond. Professors may answer students' questions publicly online, building a knowledge base that allows people who have not been part of the conversation to also benefit from their advice.⁴⁴ Online networks will allow students and faculty to contribute to conversations going on elsewhere. Academia will become less tethered, a fluid and mobile community where physical proximity is no prerequisite for intellectual proximity. By virtue of the fact that some form of online platform will function as a virtual meta-layer of

⁴⁴ See the online platforms Quora (<https://www.quora.com>) and Piazza (<https://piazza.com>) to understand what this might look like.

the university of the future, it need—by definition—not be limited to any *one* campus. That a community does not have to be tied to one place is an idea most strikingly demonstrated by institutionalized religion, but has been championed by different network organizations throughout the ages. It is in fact already familiar to higher education in the form of alumni networks.

Yet, at the level of teaching, universities have hitherto not taken a network perspective. Clearly not everything can be taught or learned in one place as evidenced by the ever-rising number of international students. This begs the question: Why the idea of franchising has so far gained little ground in higher education? The few well-known examples are the eccentric branch campuses of elite institutions (such as NYU Abu Dhabi and Shanghai or Yale University's activities in Singapore), private for-profit institutions or the study abroad opportunities offered by private non-profits (for example, Reid Hall in Paris). Columbia University's Global Centers (globalcenters.columbia.edu) can be seen as another example of a university attempting to develop global reach.

The university of the future should allow its students to tap into a wide array of learning resources irrespective of where they have been created. Unlike the ivory *tower*, a symbol for spatial concentration, many aspects of the network university will be *distributed*. The academic community of such an institution would be closely knit without being tied to a specific place.⁴⁵

In the MacArthur Foundation's *Principles of the Future of Learning*, the old and the new culture of learning are juxtaposed as follows:

If individualized learning is largely tethered to a social regime of copyright-protected intellectual property and privatized ownership, networked learning is committed in the end to an open source and open content social regime. Individualized learning tends overwhelmingly to be hierarchical: one learns from the teacher or expert, on the basis overwhelmingly of copyright-protected publications bearing the current status of knowledge. Networked learning is at least peer-to-peer and more robustly many-to-many. (Davidson and Goldberg 2009, 31)

In this “New Culture of Learning” so-called “learning ensembles” spontaneously emerge “in which the members both support and sustain, elicit from

⁴⁵ We see parallels here to the discussion on European integration and the question of whether the EU is more like a commonwealth or a federal state. We may need, with regard to universities, a neologism analogous to the German federal constitutional court's neologism of a *Staatenverbund* (association of states). See Zielonka (2008)

and expand on each other's learning inputs, contributions, and products" (Davidson and Goldberg 2009, 32). It is the task of every individual educator as well as that of every institution to reshape institutional learning in a way that not only allows for but promotes such ad-hoc coalitions characterized by flexibility, interactivity, and outcome-orientation. This challenges one of the basic pillars of our educational system, namely "the assumption that teaching is necessary for learning to occur." Instead of teaching students about the world, "the new culture of learning focuses on learning through engagement within the world" (Thomas and Brown 2011, 34, 38).

Besides being both a real and a virtual campus, a network university could maintain hubs in major cities that offer room for people to meet and interact in person. Network university hubs could operate branch campuses as a mix of a hostel, a conference center and a co-working space for professors, students, alumni and their guests. These local outlets would allow members of the university community to be based in different locations. A web-based social network could provide an institutional meta-layer that would integrate the dispersed academic community online. As an example, MinervaEC (Ministerial NEtwork for Valorising Activities in digitization, eContentplus—Supporting the European Digital Library (<http://www.minervaeurope.org>) arguably aspires to become a showcase of this new type of institution.

Public university systems in US states are based originally on similar ideas and—were it not for notorious budget shortages—would seem destined to experiment with such ideas. The Dutch university colleges could also be pioneers in this area. University federations, analogous to the alliances among airline companies that recognize academic credit earned at a partner institution, would be another possible step in this direction. Classes could flexibly be taken in person, in some form of hybrid mode or fully online. Managing such a fragmented personalized study program would, one could argue, serve as a much better preparation for what will be expected of students in 'real' life in terms of flexibility and planning skills than the rigid framework of most academic programs worldwide. Being enrolled in such a network university then would be as much about gaining access to teaching and learning materials, as it is about gaining access to the network and the intellectual resources on offer in different locations. After all what students need is not so much *one* specific place to learn. What they need is time and a community that lends them their support.

Moving Forward

Many discussions on the digital future of education quickly boil down to the argument that it is important that there be a ‘place’ where people can meet and interact, that getting a real education requires being part of a community, and that online instruction cannot replace the college experience. While all of these points are valid, we think that those who are demonizing the digitalization of educational practice are in fact romanticizing the status quo. If we were to judge the online educational format against the teaching at today’s mass universities, then critics would recognize it is time for things to change.⁴⁶ Making full use of the opportunities afforded by digital technology will increase access, improve teaching quality, make mentoring more widely available, broaden student services and facilitate peer to peer learning. It will allow for more meaningful forms of assessment, higher degrees of transparency and, indeed, a more tightly knit intellectual community. Critics warning that digitalization may create a learning environment that is characterized by distance between educators and students should contemplate the words of a student cited in an article that appeared in the *Chronicle of Higher Education*: “If you want to encounter distance education ... sit in the back of a 500-seat lecture” (Parry 2010).

The arrival of the mass university coincided with the hey-day of positivism, the belief that the principles of the ‘scientific method’ were valid at all times and in all disciplines, which led academics to seek an understanding of the world in discrete, measurable terms. Such a reductionist understanding of knowledge with its neat divisions of the world into categories of right and wrong was well suited for the labor-intensive mode of teaching prevalent at the time.

Today we are beginning to realize that teaching in this way is neither effective nor efficient. It is problematic in two ways: its binary logic misses the nuances of real life and, at the same time, the technological abstinence of instructors leads to a great deal of time being spent on relatively banal and repetitive activities.

As a next step we thus have to capitalize on the fact that intellectual necessity coincides with technological opportunity. Universities in the 21st

⁴⁶ See the efforts at Georgia Tech’s Center for 21st Century Universities (C21U <http://c21u.gatech.edu>), as well as the Center for Digital Education at the EPFL Lausanne (<http://moocs.epfl.ch>).

century will continue to perform their traditional teaching, assessment, certification and socialization functions. Yet, they will find imaginative, innovative ways of performing these functions in contexts that may look vastly different from the universities we know today (Taylor 2010). The purpose of this shift cannot be the mechanization of learning, but the re-humanization of teaching. We have to refocus student learning, placing more emphasis on small group discussions, tutoring and mentoring—in person as well as online. The mere presentation of knowledge can, at best, only be the starting point of this type of learning. Higher education has to act as a forum where people come together to negotiate truths.

The core message of this book then is that we have to move from a world where we teach knowledge as if it is universal, rational, linear, predictable and applicable everywhere to one in which we understand that knowledge is also illogical, unpredictable, local, complex, non-linear, and context-dependent. We cannot do this simply by telling ourselves and our students this is so. Only when we understand this and apply it to teaching and learning can we truly educate concerned and contextually aware citizens.

BIBLIOGRAPHY

- Adams, Henry. *The Education of Henry Adams*. Boston: Houghton Mifflin, 1918.
- Adelman, Clifford. *The Bologna process for US Eyes: Re-learning Higher Education in the Age of Convergence*. Washington, DC: Institute for Higher Education Policy, 2009.
- Agarwal, Pawan. *Indian Higher Education: Envisioning the Future*. London: Sage, 2009.
- Albrecht, Peter-Alexis. "Zur Einheit von Lehr- und Lernfrustration." *Frankfurter Allgemeine Zeitung*. December 10, 2009.
- Allan, George. "The Liberal Arts in the 21st Century: According to 'Change' and 'Liberal Education'." July 2005.
- Altbach, Philip G. "Rankings Season is Here." *International Higher Education*, no. 62 (Winter 2011): 2–4.
- Anderson, Philip. "More is Different." *Science* 177 (1972): 393–396.
- Appadurai, Arjun. *Fear of Small Numbers*. Durham, NC: Duke University Press, 2006.
- . "The Capacity to Aspire: Culture and the Terms of Recognition." In *Culture and Public Action*, edited by V. Rao and M. Walton, 59–84. Palo Alto, CA: Stanford University Press, 2004.
- Arnold, Matthew. *Culture and Anarchy*. Oxford: Oxford University Press, 2006.
- Arthur, Brian. "Positive Feedback in the Economy." *Scientific American*, no. 262 (February 1990): 92–99.
- Arum, Richard, and Josipa Roksa. *Academically Adrift: Limited Learning on College Campuses*. Chicago, IL: University of Chicago Press, 2011.
- Ash, Michael. "Bachelor of What, Master of Whom? The Humboldt Myth and Historical Transformations of Higher Education in German-Speaking Europe and the US." *European Journal of Education* 41, no. 2 (2006): 245–267.
- Auleta, Ken. "Get Rich U." *The New Yorker*, April 30, 2012.
- Bady, Aaron. "Questioning Clay Shirky." *Inside Higher Education*, December 6, 2012.
- . "Tree Sitting." *The New Inquiry*, February, 2013.

- Bakewell, Sarah. *How to Live or a Life of Montaigne in One Question and Twenty Attempts at an Answer*. New York, NY: Other Press, 2010.
- Ball, Philip. *Critical Mass: How One Thing Leads to Another*. New York, NY: Arrow Books, 2005.
- Banerjee, Abhijit, Banerjee Vinayak, and Esther Duflo. *Poor Economics: A Radical Rethinking of the Way to Fight Global Poverty*. New York, NY: Public Affairs, 2011.
- Barabasi, Albert-Laszlo. *Linked. How Everything Is Connected to Everything Else and What It Means for Business, Science, and Everyday Life*. Cambridge, MA: A Plume Book, 2003.
- Barnett, Roland. *Higher Education: A Critical Business*. Maidenhead: Open University Press, 1997.
- Barnett, Ronald, and Kelly Coate. *Engaging the Curriculum in Higher Education*. Maidenhead: Open University Press, 2005.
- Bauerlein, Mark, Mohamed Gad-el-Hak, Wayne Grody, Bill McKelvey, and Stanley W. Trimble. "We Must Stop the Avalanche of Low-Quality Research." *The Chronicle of Higher Education*, June 2010.
- Beller, Mara. "The Sokal Hoax: At Whom are we Laughing?" *Physics Today*, 1998.
- . *Quantum Dialogues*. Chicago, IL: Chicago University Press, 1999.
- Ben-David, Joseph, and Randall Collins. "Social Factors in the Origins of a New Science: The Case of Psychology." *American Sociological Review* 31, no. 4 (1966): 451–465.
- Benkler, Yochai. "The University in the Networked Economy & Society: Challenges and Opportunities." *EDUCAUSE Review*, November/December 2008: 59–72.
- Benner, Patricia, Molly Sutphen, Victoria Leonard, and Lisa Day. *Educating Nurses: A Call for Radical Transformation*. Stanford, CA: Jossey-Bass, 2010.
- Benton, Thomas H. "The Big Lie about 'Life of the Mind.'" *The Chronicle of Higher Education*, April 19, 2011.
- Berrett, Dan. "How 'Flipping' the Classroom Can Improve the Traditional Lecture." *The Chronicle of Higher Education*, February 19, 2012.
- Bhargava, Rajeev. *Politics and Ethics of the Indian Constitution*. Oxford: Oxford University Press, 2008.
- Biagoli, Mario. "From Book Censorship to Academic Peer Review." *Emergences* 12, no. 1 (2002): 11–45.
- Bischke, Jon, and Semil Shah. "Higher Education's Toughest Test." *Techcrunch*, April 24, 2011.
- Bloom, Allan. *The Closing of the American Mind*. New York, NY: Simon & Schuster, 1987.
- Bok, Derek. *Our Underachieving Colleges: A Candid Look at How Much Students Learn and Why They Should Be Learning More*. Princeton, NJ: Princeton University Press, 2006.

- . *Universities in the Marketplace: The Commercialization of Higher Education*. Princeton, NJ: Princeton University Press, 2003.
- Botstein, Leon. "Are We Still Making Citizens?" *Democracy-A Journal of Ideas* Spring (2015).
- Botton, Alain de. "What are the Humanities for?" *European Review* 7 (1999): 19–25.
- Boulton, Geoffrey, and Colin Lucas. *What are Universities for?* Amsterdam: League of European Research Universities (LERU), 2008.
- Bourdieu, P. "The forms of capital." In J. Richardson (Ed.) *Handbook of Theory and Research for the Sociology of Education*. New York, Greenwood, 241–258, 1986.
- Bowen, William G., Matthew M. Chingos, Kelly A. Lack, and Thomas I. Nygren. *Higher Education in the Digital Age*. Princeton, NJ: Princeton University Press, 2013.
- . *Interactive Learning Online at Public Universities: Evidence from Randomized Trials*. Ithaca S+R, 2012.
- Boyer, Ernest L. *College: The Undergraduate Experience in America*. New York, NY: Harper & Row, 1987.
- Brooks, David. "The New Humanism." *The New York Times*, March 7, 2011.
- Brown, John Seely, and Richard P. Adler. "Minds on Fire: Open Education, the Long Tail, and Learning 2.0." *EDUCAUSE Review* January/February (2008).
- Bruner, Jerome. *Acts of Meaning*. Cambridge, MA: Harvard University Press, 1990.
- . "Frames for thinking: ways of making meaning." In *Modes of Thought*, edited by D. Olson and B. N. Torrence, 93–105. Cambridge: Cambridge University Press, 1996b.
- . *Making Stories*. Harvard University Press, 2013.
- . *The Culture of Education*. Cambridge, MA: Harvard University Press, 1996.
- Calhoun, Craig, Eduardo Mendieta, and Jonathan VanAntwerpen. *Habermas and Religion*. Hoboken, NJ: John Wiley, 2013.
- Campbell, Joseph. *The Hero with a Thousand Faces*. New York, NY: Pantheon Books, 2008.
- Campbell, John P., Peter B. DeBlois, and Diana G. Oblinger. "Academic Analytics: A New Tool for a New Era." *EDUCAUSE Review* 42, no. 4 (2007): 40–57.
- Carey, Kevin. "Here's What Truly Change Higher Education. Online Degrees That are Seen as Official." *The New York Times*, March 5, 2015.
- Carnochan, W. B. *The Battleground of the Curriculum*. Palo Alto, CA: Stanford University Press, 1993.
- Casanova, Jose. "Rethinking Secularization." *The Hedgehog Review* Spring/Summer, 2006.
- Chapman, Paige. "Professors Shore up Wikipedia Entries on Public Policy." *The Chronicle of Higher Education*, November 3, 2010.

- Chomsky, Noam. *Aspects of the Theory of Syntax*. Cambridge, MA: The MIT Press, 1965.
- . *Language and Mind*. New York, NY: Harcourt Brace & World, Inc., 1968.
- Christensen, Clayton M. *Disrupting Class*. New York, NY: McGraw Hill, 2008.
- Clark, William. *Academic Charisma and the Origins of the Research University*. Chicago, IL: The University of Chicago Press, 2006.
- Clawson, Dan. “The Education Forum of Science.” *Science*, May 29, 2009: 324.
- Cohen, Patricia. “Scholars Test Web Alternative to Peer Review.” *The New York Times*, August 23, 2010.
- Colby, Anne, Thomas Ehrlich, Elizabeth Beaumont, and Josh Corngold. *Educating Citizens: Preparing America’s Undergraduates for Lives of Moral and Civic Responsibility*. San Francisco, CA: Jossey–Bass, 2003.
- . *Educating for Democracy: Preparing Undergraduates for Responsible Political Engagement*. San Francisco, CA: Jossey–Bass, 2007.
- Colby, Anne, Thomas Ehrlich, William M. Sullivan, Jonathan R. Dolle, and Lee S. Shulman. *Rethinking Undergraduate Business Education: Liberal Learning for the Profession*. Hoboken, NJ: Wiley, 2011.
- Coleman, James S. “Social Capital in the Creation of Human Capital.” *The American Journal of Sociology*, Vol. 94, Supplement: Organizations and Institutions: Sociological and Economic Approaches to the Analysis of Social Structure (1988), pp. S95–S120.
- Collier, Paul. *The Bottom Billion*. Oxford: Oxford University Press, 2007.
- . *The Plundered Planet*. London: Allen Lane, 2010.
- Collini, Stefan. “Browne’s Gamble.” *The London Review of Books*, November November.
- . “From Robbins to McKinsey.” *The London Review of Books*, August 2011: 9–14.
- . “HiEdBiz.” *The London Review of Books* 25, no. 21 (November 2003): 3–9.
- . *What are Universities for?* London: Penguin Books, 2012.
- Cooke, Molly, David M. Irby, and Bridget C. O’Brien. *Educating Physicians—A Call for Reform of Medical Schools and Residency*. San Francisco, CA: Jossey–Bass, 2010.
- Cook, Patricia. “Essential Texts and Know Thyself.” *Liberal Arts Online*, January 2004.
- Cornford, Frances M. *Microcosmographia Academica*. Cambridge: Bowes and Bowes Publishers, 1908.
- Cyranoski, David et al. “The Ph.D. Factory.” *Nature*, April 20, 2011.
- Dahrendorf, Ralf. *Bildung ist Bürgerrecht. Plädoyer für eine aktive Bildungspolitik*. Nannen, 1965.
- . *Die Krisen der Demokratie*. Verlag C. H. Beck, 2003.

- Davidson, Cathy N., and David Theo Goldberg. *The Classroom or the World Wide Web? Imagining the Future of Learning Institutions in a Digital Age*. Cambridge, MA: The MIT Press, 2009.
- Dear, Peter. *The Intelligibility of Nature*. Chicago, IL: University of Chicago Press, 2006.
- Deem, Rosemary, Mok, Ka Ho, and Lisa Lucas. "Transforming Higher Education in Whose Image? Exploring the Concept of the 'World-Class' University in Europe and Asia." *Higher Education Policy* 21 (2008): 83–97.
- Detienne, Marcel, and J.-P. Vernant. *Cunning Intelligence in Greek Culture and Society*. Chicago, IL: University of Chicago Press, 1991.
- Deutscher, Guy. "Same planet, different words: How much mother tongue shapes us." *International Herald Tribune*, August 2010: 28–29.
- Dewey, John. *Democracy and Education*. London: Macmillan, 1916.
- . *The Quest for Certainty: A Study of the Relation of Knowledge and Action*. Carbondale, IL: Southern Illinois University Press, 1988.
- "The Disposable Academic: Why Doing a Ph.D. is Often a Waste of Time." *Economist*. December 16, 2010.
- d'Oliveira, Cecilia, Stephen Carson, Kate James, and Jeff Lazarus. "MIT OpenCourseWare: Unlocking Knowledge, Empowering Minds." *Science* 329 (July 2010): 525–526.
- Donoghue, Frank. *The Last Professors: the Corporate University and the Fate of the Humanities*. New York, NY: Fordham University Press, 2008.
- Dor, Daniel, and Eva Jablonka. "Plasticity and Canalization in the Evolution of Linguistic Communication: An Evolutionary-Developmental Approach." In *The Evolution of Human Language*, edited by Richard Larson, Viviane Deprez and Hiroko Yamakido. Cambridge: Cambridge University Press, 2010.
- Douglas, George H. *Education without Impact: How Our Universities Fail the Young*. New York, NY: Birch Lane/Carol Publishing Group, 1992.
- Doyle, Dennis. *Reclaiming the Legacy. In Defence of Liberal Education*. Washington: Council for basic Education, 2000.
- Dräger, Jörg and Ralph Müller-Eiselt. *Die digitale Bildungsrevolution*. Munich, Germany: Random House, 2015.
- Duffo, Esther, and Abhijit Banerjee. "Poor Economics: A Radical Rethinking of the Way to Fight Global Poverty." *Public Affairs*, 2011.
- Ehrenberg, Ronald G., Harriet Zuckerman, Jeffrey A. Groen, and Sharon M. Brucker. *Educating Scholars: Doctoral Education in the Humanities*. Princeton, NJ: Princeton University Press, 2010.
- Einstein, Albert. "On the Method of Theoretical Physics' The Herbert Spencer Lecture, delivered at Oxford, 10 June 1933." *Philosophy of Science* 1, no. 2 (1934): 163–169.
- . *Out of my later years*. New York, NY: The Philosophical Library, 1950.

- Eisenstadt, Shmuel N. *Paradoxes of Democracy*. Washington, DC: The Woodrow Wilson Center Press, 1999.
- Elkana, Yehuda. "A Programmatic Attempt at an Anthropology of Knowledge." In *Sciences and Cultures. Sociology of the Sciences Yearbook V*, edited by Everett Mendelsohn and Yehuda Elkana, 1–76. 1981.
- . "Heimholz's 'Kraft': An Illustration of Concepts in Flux." *Historical Studies in the Philosophy of Science* 2 (1970): 263–298.
- . "Rethinking—Not unthinking the Enlightenment." In *Debates on Issues of Our Common Future*, edited by Wilhelm Krull. Metternich: Velbrueck Wissenschaft, 2000.
- . "Unmasking Uncertainties and Embracing Contradictions." In *Envisioning the Future of Doctoral Education*, edited by Chris M. Golde and George E. Walker, 65–96. San Francisco, CA: Jossey-Bass, 2006.
- Elkana, Yehuda, Joshua Lederberg, Robert K. Merton, Arnold Thackray, and Harriet Zuckerman. *Towards a Metric of Science: The Advent of Science Indicators*. New York, NY: John Wiley, 1977.
- Elkana, Yehudi. "The University of the 21st Century: An Aspect of Globalization." in Renn, Jürgen (ed). *The Globalization of Knowledge in History*. Max Planck Research Library for the History and Development of Knowledge, 2012. (available at <http://www.edition-open-access.de/studies/1/29/index.html>).
- European University Association. "Improving Quality, Enhancing Creativity." 2009.
- Evans, Nicholas, and Stephen Levinson. "The Myth of Language Universals: Language Diversity and its Importance for Cognitive Science." *Behavioral and Brain Sciences* 32 (2009): 429–492.
- Evans, Richard J. "The Wonderfulness of Us: The Tory Interpretation of History." *The London Review of Books*, March 17, 2011.
- Ezrahi, Yaron. *Necessary Political Fictions*. Cambridge: Cambridge University Press, 2012.
- Fallis, George. "Reclaiming the civic university." *Academic Matters*, June 2014.
- . *Multiversity, Ideas and Democracy*. Toronto: University of Toronto Press, 2007.
- Farrington, Benjamin. *The Philosophy of Francis Bacon*. Liverpool: Liverpool University Press, 1970.
- Faust, Drew. "The University's Crisis of Purpose." *New York Times*, September 6, 2009.
- Fearn, Hannah. "The Wizards of Oz." *Times Higher Education*, January 8, 2009.
- Feigenbaum, Edward E. "Herbert A. Simon, 1916–2001." *Science*, March 16, 2001.
- Ferrall, Victor E. *Liberal Arts at the Brink*. Cambridge, MA: Harvard University Press, 2011.
- Feynman, Richard P. *The Feynman Lectures on Physics. 1963. Reprint*. Pasadena, CA: California Institute of Technology, 2013.

- Fischman, Josh. "The Rise of Teaching Machines." *The Chronicle of Higher Education*, May 8, 2011.
- . "Beating the 'Not Invented Here' Mentality." *The Chronicle of Higher Education The Wired Campus Blog*, January 6, 2011b.
- Fish, Stanley. "The Value of Higher Education Made Literal." *The New York Times*, December 13, 2010.
- Fitzpatrick, Kathleen. *Planned Obsolescence: Publishing, Technology, and the Future of the Academy*. New York, NY: NYU Press, 2011.
- Fleck, Ludwik. *The Genesis and Development of a Scientific Fact*. Edited by T. J. Trewn and Robert Merton. University of Chicago, 1979.
- Flexner, Abraham. *Medical Education in the United States and Canada*. New York, NY: Carnegie Foundation for the Advancement of Teaching, 1910.
- . *Medical Education: A Comparative Study*. New York, NY: Macmillan, 1925b.
- . "Purpose in the American College." *School and Society* 572 (1925): 731.
- . *Universities—American, English, German*. Oxford: Oxford University Press, 1930.
- Flyvbjerg, Bent. *Making Social Science Matter*. Cambridge: Cambridge University Press, 2001.
- Frank, D. J., and Jay Gabler. *Reconstructing the University*. Palo Alto, CA: Stanford University Press, 2006.
- Friedrich, Carl, Gethmann Dieter, Langewiesche Jürgen, Dieter Simon, and Günter Stock. *Manifest Geisteswissenschaft*. Berlin: Brandenburgische Akademie der Wissenschaften, 2005.
- Galison, Peter. *Einstein's Clocks, Poincaré's Maps*. New York, NY: W.W. Norton, 2003.
- Galnoor, Itzhak. "Academic Freedom under Political Duress: Israel." *Social Research* 76 (2009).
- Garfield, Eugene. "Citation Indexes for Science: New Dimension in Documentation through Association of Ideas." *Science* 122, no. 3159 (July 1955): 108–111.
- Gasset, Ortega y. *The Mission of the University*. Princeton, NJ: Princeton University Press, 1944.
- Gaston, Paul. *Challenge of Bologna: What US Higher Education has to Learn from Europe and Why it Matters That it Learns*. Sterling, VA: Stylus Publication, 2010.
- Geertz, Clifford. *The Interpretation of Cultures*. New York, NY: Basic Books, 1973.
- . "Thick Description—Toward an interpretative Theory of Culture." In *The Interpretation of Cultures: Selected Essays*. New York, NY: Basic Books, 1973b.
- Gellner, Ernest. *Post-Modernism, Reason and Religion*. London: Routledge, 1992.
- Gerhardt, Volker. Humboldts Idee. "Zur Aktualität des Programms Wilhelm von Humboldts." In *Humboldts Zukunft*, edited by Bernd Henningsen 55–75. BWV, 2007.

- Gibbons, Michael, Camille Limoges, Helga Nowotny, Simon Schwartzman, Peter Scott, and Martin Trow. *The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Society*. London: Sage, 1994.
- Girmscheid, Gerhard and Dreye, Jennifer. "Public Private Partnership—Begriffliche Strukturierung und Modellbildung." *Bauingenieur Band* 81 (March 2006).
- Gladwell, Malcolm. *Tipping Point: How Little Things Can Make a Big Difference*. New York, NY: Back Bay Books, 2002.
- Gleick, James. *Chaos. Making a New Science*. Portsmouth, NH: Heinemann, 1988.
- Glenn, David. "An Elaborate Ranking of Doctoral Programs Makes its Long-awaited Debut." *The Chronicle of Higher Education*, September 28, 2010.
- Golde, Chris M., and George E. Walker, eds. *Envisioning the Future of Doctoral Education—Preparing Stewards of the Discipline*. San Francisco, CA: Jossey-Bass, 2006.
- Golden, Serena. "A Curricular Innovation, Examined." *Inside Higher Ed*, December 16, 2010.
- Goldstein, Herbert. *Classical Mechanics*. Boston, MA: Addison Wesley, 2001.
- Goleman, Daniel. *Emotional Intelligence*. New York, NY: Bantam Books, 1998.
- Goodman, Nelson. *Ways of Worldmaking*. Indianapolis, IN: Hackett Publishing Company, 1978.
- Grafton, Anthony. "Humanities and Inhumanities." *The New Republic*, February 17, 2010.
- Granovetter, Mark. "The Strength of Weak Ties." *American Journal of Sociology* 78 (1973).
- Green, Donald P., and Alan Shapiro. *Pathologies of Rational Choice Theory*. New Haven, CT: Yale University Press, 1994.
- Green, Kenneth C. "Mapping the Terrain of Online Education." *Inside Higher Ed*, November 21, 2010.
- Greenberg, Daniel S. *Science for Sale: The Perils, Rewards and Delusions of Campus Capitalism*. Chicago, IL: University of Chicago Press, 2007.
- Gross, Alan G. *The Rhetoric of Science*. Cambridge, MA: Harvard University Press, 1990.
- Gross, Alan G., and Joseph E. Harmon, eds. *The Scientific Literature*. Chicago, IL: University of Chicago Press, 2007.
- Gross, Alan G., Joseph E. Harmon, and Michael Reidy. *Communicating Science—the Scientific Article from the 17th Century to the Present*. Oxford: Oxford University Press, 2002.
- Habermas, Jürgen. "The Idea of the University—Learning Processes." *New German Critique* 41 (1987): 3.
- Hacker, Andrew, and Claudia Dreifus. *Higher Education? How Colleges are Wasting our Money and Failing Our Kids—and What We Can Do About It*. New York, NY: Times Books, 2010.
- Hafner, Katie. "An Open Mind." *New York Times*, April 8, 2010.

- Hauser, Uwe Jean. "Ökonomie: Gebt zu, ihr wisst es nicht." *Die Zeit*, December 22, 2010.
- Heinemann, F. N. "Globus Intellectualis." *Philosophy* 19 (1944): 242–260.
- Hennock, Mary. "U. of Hong Kong Looks to the West in Curricular Redesign." *The Chronicle of Higher Education*, July 18, 2010.
- Hersh, Richard H. "What Does College Teach?" *Atlantic Monthly*, November 2005.
- Hirschman, Albert. *The Passions and the Interests*. Princeton, NJ: Princeton University Press, 1977.
- Howe, Jeff. *Crowdsourcing*. New York, NY: Three Rivers Press, 2009.
- Huizinga, Johan. *Homo Ludens*. Boston, MA: Beacon Press, 1971.
- Humboldt, Wilhem von. "Der Koenigsberger und der Litauischen Schulplan." In *Wilhelm von Humboldt, in 5 vols.*, edited by A. Flitner and K. Giel. Darmstadt: Wissenschaftliche Buchgesellschaft, 2002.
- Ihlwan, Moon. "Where A Teacher Can Make Millions." *Bloomberg Businessweek*, December 11, 2006.
- Ikeuchi, Satoru. "A Country's Lasting Aftershocks." *International Herald Tribune*, March 21, 2011.
- Jablonka, Eva, and Marion Lamb. *Evolution in Four Dimensions*. Cambridge, MA: MIT Press, 2005.
- James, William. *A Pluralistic Universe*. 1909. Reprint. New York, NY: General Books, 2009.
- . *Pragmatism*. 1097. Reprint. New York, NY: Dover Publications, 1995.
- . "Rationality, Activity and Faith." *The Princeton Review* 2 (1882): 58–59.
- . "Remarks on Spencer's Definition of Mind as Correspondence." *The Journal of Speculative Philosophy*, 1878.
- . "The Ph.D. Octopus." *Harvard Monthly*, March 1903: 149–157.
- Janik, Allan, and Stephen Toulmin. *Wittgenstein's Vienna*. New York, NY: Pocket Books, 1973.
- Jarvis, Jeff. "New rule: Cover what you do best. Link to the rest." *Buzzmachine*, February 22, 2007.
- Jasanoff, Sheila. "Technologies of Humility." *Nature*, November 1, 2007.
- Jaschik, Scott. "An Open, Digital Professoriat." *Inside Higher Ed*, January 10, 2011.
- . "Dissing the Dissertation." *Inside Higher Ed*, January 9, 2012.
- . "Revolt against Outsourced Courses." *Inside Higher Ed*, March 31, 2009.
- . "Tenure in a Digital Era." *Inside Higher Education*, May 26, 2009b.
- Jaspers, Karl. *The Idea of the University*. Boston, MA: Beacon Press, 1959.
- Jespersen, Otto. "Language—its Nature, Development and Origin." In *Selected Writings of Otto Jespersen*, by Otto Jespersen. London: Routledge, 2010.
- Johnson, Susan. *How Boards Oversee Educational Quality: A Report on a Survey on Boards and the Assessment of Student Learning*. Washington, DC: Association of Governing Boards of Universities and Colleges, 2010.

- Jones, Diane Auer. "Financial Pain Should Focus Universities." *Nature*, May 6, 2010: 32.
- Judt, Tony. "Meritocrats." *New York Review of Books*, August 19, 2010.
- Kamenetz, Anya. *DIY U: Edupunks, Edupreneurs, and the Coming Transformation of Higher Education*. Junction, VT: Chelsea Green Publishing, 2010.
- . "How Web-Savvy Edupunks Are Transforming American Higher Education." *Fast Company*, September 1, 2009.
- . "The Virtual University." *The American Prospect*, April 20, 2010b.
- Kant, Immanuel. *The Conflict of the Faculties (Der Streit Der Fakultäten)*. Translated by Mary J. Gregor. Lincoln, NE: University of Nebraska Press, 1979.
- Kapuscinski, Ryszard. *The Other*. New York, NY: Verso Books, 2008.
- Kaube, Jürgen, ed. *Die Illusion der Exzellenz: Lebenslügen der Wissenschaftspolitik*. Politik bei Wagenbach, 2009.
- Kauffmann, Stuart. *Reinventing the Social: A New View of Science, Reason, and Religion*. New York, NY: Basic Books, 2008.
- Kay, John. "Only Market Evangelists reconcile Jekyll with Hyde." *Financial Times*, June 5, 2012.
- Kehm, Barbara M. "Doctoral Education in Europe: New Structures and Models." In *Towards a Multiversity*, edited by George Kruecken, Anna Kosmützky, and Marc Torka. Bielefeld: Transcript Verlag, 2007.
- Kelly, Andrew P., and Frederick M. Hess. "Beyond Retrofitting: Innovation in Higher Education, Hudson Institute Initiative on Future." *Innovation*, June 2013.
- Kerr, Clark. *The Uses of the University*. 1963. *Republished*. Cambridge, MA: Harvard University Press, 2001.
- Khan, Salman. "YouTube U. Beats YouSnooze U." *The Chronicle of Higher Education*, October 31, 2010.
- Kimball, Bruce A. "Toward Pragmatic Liberal Education." In *The Condition of American Liberal Education/Pragmatism and a Changing Tradition*, edited by Robert Orrill. New York, NY: College Entrance Examination Board, 1995.
- King, P. M., and K. S. Kitchener. *Developing Reflective Judgment*. San Francisco, CA: Jossey-Bass, 1994.
- Kirkendall, Ursula. "The Sources for Bach's Musical Offering: The Institutio Oratoria of Quintilian." *Journal of the American Musicological Society* XXXIII (1980): 88–141.
- Kirp, David L. *Shakespeare, Einstein, and the Bottom Line: The Marketing of Higher Education*. Oxford, MA: Harvard University Press, 2004.
- Kolowich, Steve. "A Great Experiment." *Inside Higher Ed*, February 22, 2010.
- . "A Political Online Push." *Inside Higher Ed*, June 17, 2010b.
- . "Assessing Campus MOOCs." *Inside Higher Ed*, November 14, 2012d.
- . "Behind the Webcam's Watchful Eye, Online Proctoring Takes Hold." *The Chronicle of Higher Education*, April 15, 2013b.

- . “Coursera Takes a Nuanced View of MOOC Dropout Rates.” *The Chronicle of Higher Education*, April 8, 2013.
- . “How Will MOOCs Make Money?” *Inside Higher Ed*, June 11, 2012.
- . “Hybrid Education 2.0.” *Inside Higher Ed*, December 28, 2009.
- . “Libraries’ Digital Direction.” *Inside Higher Ed*, April 4, 2011.
- . “MOOCing on Site.” *Inside Higher Ed*, September 7, 2012b.
- . “MOOCs for Credit.” *Inside Higher Ed*, October 29, 2012c.
- . “Seed of Doubt.” *Inside Higher Ed*, June 22, 2010c.
- . “San Jose State U. Puts MOOC Project with Udacity on Hold.” *Chronicle of Higher Education*, July 19, 2013c.
- . “The Specialists.” *Inside Higher Ed*, April 5, 2010d.
- Krips, Henry, J. E. McGuire, and Trevor Melia. *Science, Reason and Rhetoric*. Pittsburgh, PA: University of Pittsburgh, 1995.
- Krucken, G., A. Kosmützky, and M. Torka. *Towards a Multiversity*. Bielefeld, 2007.
- Kuhn, Thomas. *The Structure of Scientific Revolution*. Chicago, IL: University of Chicago Press, 1962.
- Kumar, M. S. Vijay, and Toru Iiyoshi. *Opening Up Education: The Collaborative Advancement of Education through Open Technology, Open Content, and Open Knowledge*. Cambridge, MA: MIT Press, 2008.
- Kurzweil, Ray. *The Singularity Is Near: When Humans Transcend Biology*. New York: Viking, 2005.
- Lamont, Michelle. *How Professors Think: Inside the Curious World of Academic Judgment*. Cambridge, MA: Harvard University Press, 2009.
- Lanczos, Cornelius. *The Variational Principles of Mechanics*. Mineola, NY: Dover Publications, 1986.
- Laster, Jill. “A Swarm of Volunteers, a Honey of an Idea.” *The Chronicle of Higher Education*, May 28, 2010.
- Lazerson, Marvin. *Higher Education and the American Dream*. Budapest: Central European University Press, 2010.
- LeBlanc, Paul. “The New For-Profits.” *Inside Higher Ed*, May 31, 2013.
- Ledermann, Doug. “A Marriage Made in Indiana.” *Inside Higher Ed*, July 14, 2010.
- Lensing, Britta. “Inerstaatliches Franchising von Studiengängen – ein Graubereich im deutschen Hochschulsektor.” *Zeitschrift Hochschul-management*, 2/2012.
- Lévi-Strauss, Claude. *The Savage Mind*. Chicago, IL: University of Chicago Press, 1966.
- Lewin, Tamar. “Universities Team with Online Course Provider.” *The New York Times*, May 30, 2013.
- . “Promising Full College Credit. Arizona State University Offers Online Freshman Program.” *The New York Times*, April 22, 2015.
- Light, Richard J. *Making the Most of College: Students Speak their Minds*. Cambridge, MA: Harvard University Press, 2001.

- Lipscomb, Andrew A., and Albert Ellery Bergh. *The Writings of Thomas Jefferson*. Washington, DC: Thomas Jefferson Memorial Association, 1905.
- Lloyd, G. E. R. *Cognitive Variations*. Oxford: Oxford University Press, 2007.
- Lorenz, Edward N. *The Essence of Chaos*. London: University College London Press, 1995.
- Lorenzo, George, and John Ittelson. *A Brief Overview of Student Learning Outcomes Assessment in Higher Education*. Buffalo, NY: Lorenzo Associates Inc., 2010.
- Lucas, Christopher J. *American Higher Education—A History*. New York, NY: Palgrave MacMillan, 2007.
- Lucas, Henry C. “Professors Hate Online Education. To Save Colleges They have to Learn to Love it.” *Washington Post*, April 27, 2016.
- Lynch, Richard. “Rethinking Critical Thinking: Values and Attitudes.” *Tomorrow’s Professor*, September 18, 2003.
- Liotard, Jean-Francois. *The Postmodern Condition: A Report on Knowledge*. Manchester: Manchester University Press, 1979. Reprint 1984.
- Müller-Eiselt, Ralph P. “Hochschulräte im internationalen Vergleich.” In *Stifterverband für die deutsche Wissenschaft*, by Handbuch Hochschulräte: Dankanstöße und Erfolgsfaktoren für die Praxis. 2010.
- Maeda, John. “Actually Going to Class, for a Specific Course? How 20th-Century.” *The Chronicle of Higher Education*, February 27, 2011.
- Mandell, Laura. “Tenure in a Digital Era.” *Inside Higher Education*, May 26, 2009.
- Markschies, Christoph. *Was von Humboldt noch zu Lernen ist*. Berlin: Berlin University Press, 2010.
- Marshall, Thomas H. “Citizenship and Social Class.” In *Sociology at the Crossroads and Other Essays*. London, 1963.
- Max-Neef, Manfred. “Foundations of Transdisciplinarity.” *Ecological Economics* 53 (2005): 15.
- McGann, Jerome, et al. “Crunching Words in Great Number.” *The Chronicle of Higher Education*, June 3, 2010.
- Menand, Louis. *The Marketplace of Ideas: Reform and Resistance in the American University*. New York, NY: W. W. Norton & Co, 2010.
- Meredith, Dennis. *Explaining Research: How to Reach Key Audiences to Advance Your Work*. Oxford: Oxford University Press, 2010.
- . “Please Explain: Training Scientists to Be Better Communicators.” May 20, 2010b.
- Mersh, Britta. “Studiengänge zu verkaufen. Auf dem Weg zur McUniversity.” *DUZ*, August 24, 2013.
- Merton, Robert K. *On the Shoulders of Giants*. Florence, MA: Free Press, 1965.
- . *Sociology of Science and Sociology as Science*. Edited by Craig Calhoun. Columbia University Press, 2010.
- . *The Sociology of Science—an Episodic Memoir*. Carbondale, IL: Southern Illinois University Press, 1977.

- . “Tradition, Ecology and Institution in the History of Sociology.” *Daedalus* 99 (1970): 763.
- Milliron, Mark David. “Online Education vs. Traditional Learning—Time to End the Family Feud.” *The Chronicle of Higher Education*, October 31, 2010.
- Mitchell, Melanie. *Complexity: a Guided Tour*. Oxford: Oxford University Press, 2009.
- Mohrman, Kathryn, Wanhua Ma, and David Baker. “The Research University in Transition: The Emerging Global Model.” *Higher Education Policy* 21 (2008): 5–27.
- Morgan, Gwyn. “If Universities Were In Business, They’d Be Out Of Business.” *Globe and Mail*, October 3, 2010.
- Müller-Eiselt, Ralph P. “Hochschulräte im internationalen Vergleich.” In *Handbuch Hochschulräte. Denkanstöße und Erfolgsfaktoren für die Praxis*, edited by Volker Meyer-Guckel, Mathias Winde, and Frank Ziegele, Edition Stifterverband, 2010.
- Nagel, Thomas. *The View from Nowhere*. Oxford: Oxford University Press, 1986.
- Nerad, Maresi. “The Ph.D. in the US: Criticisms, Facts, and Remedies.” *Higher Education Policy* 17 (2004): 183–199.
- Nesse, Randolph M., and George C. Williams. *Why We Get Sick: the New Science of Darwinian Medicine*. New York, NY: Vintage Books, 1996.
- Newman, John Henry. *The Idea of the University*. South Bend, IN: Notre Dame University Press, 1982.
- Nowotny, Helga. “The Increase of Complexity and its Reduction.” *Theory, Culture & Society* 22 (2005).
- Nowotny, Helga, Peter Scott, and Michael Gibbons. *Rethinking Science: Knowledge in an Age of Uncertainty*. Cambridge: Polity, 2001.
- Nussbaum, Martha. *Creating Capabilities: The Human Development Approaches*. Oxford, MA: Harvard University Press, 2001.
- . *Cultivating Humanity—a Classical Defense of Reform in Liberal Education*. Oxford, MA: Harvard University Press, 1997.
- Papert, Seymour. *Mindstorms: Children, Computing and Powerful Ideas*. New York: Basic Books, 1980.
- Parry, Marc. “Big Data on Campus.” *The New York Times*, July 18, 2012.
- . “Competency-Based Education Advances with U.S. Approval of Program.” *The Chronicle of Higher Education*, April 18, 2013.
- . “Online, Bigger Classes May Be Better Classes: Experimenters Say Diversity Means Richness.” *The Chronicle of Higher Education*, August 29, 2010b.
- . “Online Venture Energizes Vulnerable College.” *The Chronicle of Higher Education*, August 28, 2011.
- . “The Humanities Go Google.” *The Chronicle of Higher Education*, May 28, 2010c.

- . “Tomorrow’s College.” *The Chronicle of Higher Education*, October 31, 2010.
- Pears, Ian. “After Browne.” *The London Review of Books*. March 17, 2011.
- Peirce, Charles. “How to Make Our Ideas Clear.” *Popular Science Monthly* 12 (1878): 286–302.
- Perlstein, Rick. “In America, Crazy Is a Pre-existing Condition ‘... the crazy tree blooms in every moment of liberal ascendancy...’” *The Washington Post*, August 18, 2009.
- Picht, Georg. *Die Deutsche Bildungskatastrophe*. München, 1965.
- Polanyi, Michael. *The Tacit Dimension*. London: Routledge, 1966.
- Popper, Karl. “The Open Society and its Enemies Revisited.” *The Economist*, April 23, 1988: 111–119.
- Porter, Michael E., and Mark R. Kramer. “The Big Idea: Creating Shared Value.” *Harvard Business Review*, January–February 2011.
- Pulley, John. “The Secret of Southern New Hampshire University’s Success.” *Campus Technology*, January 29, 2014.
- Putnam, Hilary. *Pragmatism: An Open Question*. Hoboken, NJ : Wiley, 1995.
- Rabelais, von Francois. *Gargantuan and Pantagruel*. Translated by M. A. Screech. Penguin, 2010.
- Reiser, Robert A. “A history of instructional design and technology: Part I: A History of Instructional Media.” *Educational Technology Research and Development* 49, no. 1 (2001): 53–64.
- Renfrew, Colin. *Prehistory*. New York, NY: The Modern library, 2007.
- Richards, I. A. *The Philosophy of Rhetoric*. Oxford: Oxford University Press, 1936.
- Richardson, Robert D. *William James: In the Maelstrom of American Modernism. A Biography*. Boston, MA: Houghton Mifflin Company, 2006.
- Rifkin, Jeremy. *The Third Industrial Revolution: How Lateral Power is Transforming Energy, the Economy, and the World*. New York, NY: Palgrave Macmillan, 2011.
- Risse, Thomas, Stephen C. Ropp, and Kathryn Sikkink. *The Power of Human Rights, International Norms and Domestic Change*. Cambridge: Cambridge University Press, 1999.
- Romano, Carlin. “Wise Men Gone.” *The Chronicle of Higher Education*, January 29, 2010.
- Rosen, Jay. “Audience Atomization Overcome: Why the Net Erodes the Authority of the Press.” *The Huffington Post*, April 14, 2009.
- Rothblatt, Sheldon. *The Modern University and its Discontents: The Fate of Newman’s Legacies in Britain and America*. Cambridge: Cambridge University Press, 1997.
- Rubin, Brent. *Pursuing Excellence*. San Francisco, CA: Jossey–Bass, 2004.
- Ruse, Michael. “Good News for Science Education.” *The Chronicle of Higher Education*, April 29, 2011.
- Sajó, András. *Constitutional Sentiments*. New Haven, CT: Yale University Press, 2011.

- Sassen, Saskia. *The Global City: New York, London, Tokyo*. Princeton, NJ: Princeton University Press, 2001.
- Schmidt, Peter. "University Honors Colleges Pitch the 'Liberal-Arts College Experimente.'" *Chronicle of Higher Education*, February 28, 2010.
- Schopenhauer, Arthur. "Parerga und Paralipomena: Kleine philosophische Schriften." *Band 1* (1851): 22–23.
- Schumpeter, Joseph A. *Capitalism, Socialism and Democracy*. London: Routledge, 1974.
- Scott, Peter. "The End of the European University?" *European Review* 6 (1998): 441–457.
- Sedlacek, William E. *Beyond the Test—Non-cognitive Assessment in Higher Education*. San Francisco, CA: Jossey–Bass, 2004.
- Sen, Amartya. "Equality of What?" In *Choice, Welfare and Measurement*. Oxford: Blackwell, 1982.
- . *Inequality Re-Examined*. Oxford: Oxford University Press, 1992.
- . *Poverty and Famines*. Oxford: Oxford University Press, 1982b.
- . *Rationality and Freedom*. Oxford, MA: Harvard University Press, 2002.
- . *The Idea of Justice*. London: Allen Lane, 2009.
- Shank, J. B. "A Political Online Push." *Inside Higher Ed*, June 17, 2010.
- Shapiro, Alan. *The Flight from Reality in the Human Sciences*. Princeton, NJ: Princeton University Press, 2005.
- Shattock, Michael. "The Internal and External Threats to the University of the 21st Century." *Minerva* 30 (1992).
- Shearmur, Jeremy, and Piers Norris Turner, eds. *After the Open Society*. London: Routledge, 2008.
- Sheppard, Sheri D., Kelly Macatangay, Anne Colby, and William M. Sullivan. *Educating Engineers: Designing for the Future of the Field*. San Francisco, CA: Jossey–Bass, 2009.
- Shils, Edward. "The Idea of the University: Obstacles and Opportunities in Contemporary Societies." *Minerva* 30 (1992).
- Shinn, Larry D. "Faith, Reason, and Know Thyself." *Liberal Arts Online*, January 2004.
- Shulman, Lee S. "Doctoral Education Should not be a Marathon—the Salvation May Mean Embracing the Enemy: the Professional Schools." *The Chronicle of Higher Education*, April 4, 2010.
- . "Pedagogies of Uncertainty." *Liberal Education*. Spring 2005.
- . "Signature Pedagogies in the Professions." *Daedalus* Summer (2005b): 52.
- Siemens, George. "Penetrating the Fog: Analytics in Learning and Education." *EDUCAUSE Review* 46, no. 5 (2011): 31–40.
- Slater, Niall W. "Re-Inventing the Trivium: Debate, Dialogue—and Empathy." *Liberal Arts Online*, May 2005.

- Slaughter, Sheila. "The Political Economy of Curriculum-Making in American Universities." In *The Future of the City of Intellect*, edited by Steven Brint, 260. Palo Alto, CA: Stanford University Press, 2002.
- Slaughter, Sheila, and Gary Rhoades. *Academic Capitalism and the New Economy: Markets, State and Higher Education*. Baltimore, MD: Johns Hopkins University Press, 2009.
- Smith, John Maynard, and E. Szathmari. *The Major Transitions in Evolution*. Oxford: Oxford University Press, 2001.
- Sokal, Alan. *Beyond the Hoax*. Oxford: Oxford University Press, 2008.
- Soros, George. *The Alchemy of Finance: Reading the mind of the Market*. Hoboken, NJ: John Wiley, 1987.
- Soyinka, Wole. "Every Dictator's Nightmare." *New York Times*, April 18, 1999.
- Spedding, James, Robert L. Ellis, and Douglas D. Heath eds. *The Works of Francis Bacon: Baron of Verulam, Viscount of St. Alban, and Lord High Cancellor of England. Works VIII. (1870)*; Garrett Press, 1968, 108–109.
- Spiewak, Martin. "Falsches Vorbild." *Die Zeit*, June 21, 2009.
- Spitta, Dietrich. "Die Erziehungs- und Bildungsideal Wilhelm von Humboldts." In *Collection of essays "Der Bologna-Prozess..."* Humboldt-Gesellschaft Publication, 2009.
- Sullivan, William. *Work and Integrity: The Crisis and Promise of Professionalism in America*. San Francisco, CA: Jossey-Bass, 2005.
- Sullivan, William M., Anne Colby, Judith Welch Wegner, Lloyd Bond, and Lee S. Shulman. *Educating Lawyers*. San Francisco, CA: Jossey-Bass, 2007.
- Sullivan, William, and Matthew Rosin. *A New Agenda for Higher Education: Shaping a Life of the Mind for Practice*. San Francisco, CA: Jossey-Bass, 2008.
- Summers, Lawrence H. "What You (Really) Need to Know." *The New York Times*, January 20, 2012.
- Sunstein, Cass. *Legal Reasoning and Political Conflict*. Oxford: Oxford University Press, 1996.
- Tapscott, Don. "The Impending Demise of the University." *Edge – The third culture*, June 4, 2009.
- Tapscott, Don, and Anthony D. Williams. "Innovating the 21st-Century University: It's Time!" *EDUCAUSE Review*, 45 2010: 16–29.
- Taylor, Charles. *A Secular Age*. Oxford, MA: Harvard University Press, 2007.
- Taylor, Mark C. *Crisis on Campus*. New York, NY: Alfred A. Knopf, 2010.
- Thackray, Arnold, and Robert K. Merton. "On Discipline Building: The Paradoxes of George Sarton." *Isis* 63 (1972): 473–495.
- Thomas, Douglas, and John Seely Brown. *A New Culture of Learning*. CreateSpace, 2011.
- Thomas, Jahn. "Transdisziplinarität in der Forschungspraxis." In *Transdisziplinäre Forschung. Integrative Forschungsprozesse verstehen und bewerten*, by Matthias Bergmann and Engelbert Schramm. Frankfurt: Campus Verlag, 2008.

- Toulmin, Stephen. *Cosmopolis*. Chicago, IL: University of Chicago Press, 1990.
- . *Return to Reason*. Oxford, MA: Harvard University Press, 2001.
- . *The Uses of Argument*. Cambridge: Cambridge University Press, 2003.
- Tracz, Vitek. “Facebook of Science’ Seeks to Reshape Peer Review.” *The Chronicle of Higher Education*, January 30, 2011.
- Twigg, Carol A. “Improving Learning and Reducing Cost: New Models for Online Learning.” *EDUCAUSE Review*, September/October 2003: 28–38.
- Vries, Hent de, ed. “Public Religions Revisited.” In *Religions Beyond the Concept*, edited by Hent de Vries. New York, NY: Fordham University Press, 2008.
- Vygotsky, Lev. *Thought and Language*. Cambridge, MA: MIT Press, 1987.
- Waldrop, M. Mitchell. *Complexity. The Emerging Science at the Edge of Order and Chaos*. London: Simon & Schuster, 1993.
- Walker, George E., Chris M. Golde, Laura Jones, Andrea Conklin Bueschel, and Pat Hutchings, eds. *The Formation of Scholars*. San Francisco, CA: Jossey-Bass, 2008.
- Walsh, Taylor. *Unlocking the Gates: How and Why Leading Universities Are Opening Up Access to Their Courses*. Princeton, NJ: Princeton University Press, 2011.
- Weiler, Hans N. “Ambivalence and the politics of knowledge: The struggle for change in German higher education.” *Higher Education* 49, no. 1-2 (2005): 177–195.
- Weinberg, Steven. *Dreams of a Final Theory*. New York, NY: Pantheon Books, 1992.
- Wende, Marijk van der. “The Emergence of Liberal Arts and Science Education in Europe: A Comparative Perspective.” *Higher Education Policy* 2 (2011): 233–253.
- Welzer, Harald, and Ludger Heidbrink, eds. *Das Ende der Bescheidenheit—Zur Verbesserung der Geistes- und Kulturwissenschaften*. C. H. Beck, 2007.
- Whitehead, Alfred North. *The Concept of Nature: The Tarner Lectures Delivered in Trinity College, November 1919*. Cambridge: Cambridge University Press, 1920.
- Whittemore, Nathaniel. “The Revolution in Cool: Why Doing Real Sh*t is the Next Big Thing.” *Assetmap Blog*, November 11, 2010.
- Wiley, David, and John III Hilton. “Openness, Dynamic Specialization, and the Disaggregated Future of Higher Education.” *International Review of Research in Open and Distance Learning* 10, no. 5 (2009).
- Wilkinson, Richard, and Kate Pickett. *Why Equality is better for Everyone*. London: Penguin Books, 2010.
- Woolf, Virginia. “Montaigne.” In *The Common Reader*. University of Adelaide, 2015.
- Young, Jeffrey R. “6 Top Smartphone Apps to Improve Teaching, Research, and Your Life.” *The Chronicle of Higher Education*, January 2, 2011b.
- . “Crowd Science Reaches New Heights.” *The Chronicle of Higher Education*, May 28, 2010b.

- . “Inside the Coursera Contract: How an Upstart Company Might Profit from Free Courses.” *The Chronicle of Higher Education*, July 19, 2012.
- . “Providers of Free MOOC’s Now Charge Employers for Access to Student Data.” *The Chronicle of Higher Education*, December 4, 2012b.
- . “TED Conference Turns Professors into Stars.” *The Chronicle of Higher Education*, March 4, 2011.
- . “To Save Students Money, Colleges May Force a Switch to E-Textbooks.” *The Chronicle of Higher Education*, October 24, 2010.
- Young, Michael. *The Rise of the Meritocracy 1870–2033*. London: Thames and Hudson, 1958.

Online Sources

- 2U, Annual Report 2015. <https://2u.com/2015-annual-report>.
- Anderson, Chris. *A web-empowered revolution for teaching*. http://www.edge.org/q2009/q09_2.html#andersonc.
- APLU (Association of Public and Land-Grant Universities Sloan National Commission on Online Learning). http://sloanconsortium.org/publications/survey/APLU_Reports.
- Augmented Trader (blog). “About MOOC completion rates. The Importance of Student Investment.” January 6, 2013. augmentedtrader.wordpress.com/2013/01/06/about-mooc-completion-rates-the-importance-of-investment.
- Barrett Honors College, Arizona State University. <http://barretthonors.asu.edu>.
- BBC online. *Sam Pitroda: Digital Giants*. http://news.bbc.co.uk/2/hi/in_depth/sci_tech/digital_giants/8551904.stm.
- Bennington College, Center for the Advancement of Public Action. <http://www.bennington.edu/Benningtonandtheworld/CAPA>.
- Brown, John Seely, and Douglas Thomas. *The Gamer Disposition*. February 14, 2008. http://blogs.hbr.org/cs/2008/02/the_gamer_disposition.html.
- Bundesministerium für Bildung und Forschung, Dialog Wissenschaft–Gesellschaft. <http://www.bmbf.de/de/1758.php>.
- Businessweek online. http://www.businessweek.com/magazine/content/06_50/b4013056.htm.
- Buzzmachine online. <http://www.buzzmachine.com/2007/02/22/new-rule-cover-what-you-do-best-link-to-the-rest>.
- C2iU website. <http://c2iU.gatech.edu/about-c2iU>.
- CCRC. Shanna Smith Jaggars and Thomas Bailey. “Effectiveness of Fully Online Courses for College Students: Response to a Department of Education Meta-Analysis.” July, 2010. <http://ccrc.tc.columbia.edu/Publication.asp?UID=796>.

- Chickering, Arthur W., and Zelda F. Gamson. "Seven Principles For Good Practice in Undergraduate Education." <http://www.aahea.org/articles/sevenprinciples1987.htm>.
- Columbia University. globalcenters.columbia.edu.
- d'Aspremont, Jean. "In Defense of the Hazardous Tool of Legal Blogging." January 6, 2011.
- Die Presse. <http://diepresse.com/home/bildung/universitaet/535181/WU-hat-die-schlechteste-Betreuung-aller-Unis>.
- d'Oliveira, Cecilia, Stephen Carson, Kate James, and Jeff Lazarus. "MIT OpenCourseWare: Unlocking Knowledge, Empowering Minds." *Science*. July 30, 2010. <http://science.sciencemag.org/content/329/5991/525.full>.
- Essbach, Wolfgang. "Die Falsche Reform—BA und MA Studiengänge in der Kritik." <http://www.soziologie.uni-freiburg.de/Personen/essbach/V-Die%20falsche%20Reform.pdf>.
- European College of Liberal Arts Website. <http://www.ecla.de/academics/value-studies/>.
- F1000 website. <http://f1000.com/about/whatis>.
- Fallis, George. "The Mission of the University." October 2004. <http://www.cou.on.ca/issues-resources/student-resources/publications/reports/pdfs/the-mission-of-the-university---submission-for-the.aspx>.
- Fishman, Rachel. "State U Online." <http://education.newamerica.net/sites/newamerica.net/files/policydocs>.
- Global Conflicts online. <http://www.globalconflicts.eu>.
- Guardian online. 2016. <http://mps-expenses.guardian.co.uk>.
- Harvard online. <http://athome.harvard.edu/programs/light/index.html>.
- Harvard Social Science Division. <http://socialscience.fas.harvard.edu/hardproblems>.
- Hochschulreferat Studium und Lehre, LMU München, Handreichung zur Anerkennung von Studien- und Prüfungsleistungen, (Schwerpunkt: Gleichwertigkeitsprüfung) Version 1. June 2012. <http://portal.mytum.de/studium-und-lehre/bologna/handreichung.pdf/> (accessed July 29, 2013).
- Hollands, F. M. and D. Tirthali. "MOOCs: expectations and reality." Full report: <http://files.eric.ed.gov/fulltext/ED547237.pdf>.
- Hong Kong University. <http://www.hku.hk>.
- Internet World Stats. <http://www.internetworldstats.com/stats.htm>.
- Ithaka S+R. <http://www.ithaka.org>
- Jacobs University. <http://shss.jacobs-university.de/shss/gem>.
- Jacobs University Bremen. <http://www.jacobs-university.de/study/undergraduate>.
- Jacobs, Dov. "Some thoughts on the Legal Blogging debate: looking at the shooter, not the gun..." January 7, 2011.
- Jefferson, Thomas. "The Writings of Thomas Jefferson." *Edited by Andrew A. Lipscomb and Albert Ellery Bergh. 20 vols.* Washington: Thomas Jefferson

- Memorial Association. 1905. http://press-pubs.uchicago.edu/founders/documents/at_8_812.html (accessed July 29, 2013).
- Khan Academy. <http://www.khanacademy.org>.
- Kolowich, Steve. "Assessing Campus MOOCs." November 2012. www.insidehighered.com; <http://www.insidehighered.com/news/2012/11/14/gates-will-fund-14-million-research-project-study-mooc-powered-courses-umaryland> (accessed July 29, 2013).
- . "Behind the Webcam's Watchful Eye, Online Proctoring Takes Hold." April 2013. <http://chronicle.com/article/Behind-the-Webcams-Watchful/138505/> (accessed July 29, 2013).
- . "Coursera Takes a Nuanced View of MOOC Dropout Rates." 2013. April 8, 2013. <http://chronicle.com/blogs/wiredcampus/coursera-takes-a-nuanced-view-of-mooc-dropout-rates/43341> (accessed July 29, 2013).
- . "How Will MOOCs Make Money?" June 11, 2012. <http://www.insidehighered.com/news/2012/06/11/experts-speculate-possible-business-models-mooc-providers> (accessed July 29, 2013).
- . "MOOCing on Site." September 2012. <http://www.insidehighered.com/news/2012/09/07/site-based-testing-deals-strengthen-case-granting-credit-mooc-students> (accessed July 29, 2013).
- . "Open CourseWare 2.0." December 13, 2011. <http://www.insidehighered.com/news/2011/12/13/stanfords-open-courses-raise-questions-about-true-value-elite-education> (accessed July 29, 2013).
- . "San Jose State U. Puts MOOC Project With Udacity on Hold." July 19, 2013. <http://chronicle.com/article/San-Jose-State-U-Puts-MOOC/140459/>.
- Korn, Melissa A., and Jennifer Levitz. "Online Courses Look for a Business Model." January 13, 2013. <http://online.wsj.com/article/SB10001424127887324339204578173421673664106.html> (accessed July 29, 2013).
- Lasse-Herrmann, Bjoern. October 4, 2010. <http://emergenttransformation.com/the-illusion-of-disrupting-vs-repairing-the-e>.
- League of European Research Universities. "Doctoral Degrees Beyond 2010: Training Talented Researchers for Society." 2010. http://www.leru.org/files/publications/LERU_Doctoral_degrees_beyond_2010.pdf.
- Leibniz Kolleg. <http://www.uni-tuebingen.de/leibniz-kolleg/studium.html>.
- Lewin, Tamar. "Promising Full College Credit. Arizona State Offers Online Freshman Program," in *The New York Times*. April 22, 2015. http://www.nytimes.com/2015/04/23/us/arizona-state-university-to-offer-online-freshman-academy.html?_r=0.
- Liberal Arts Online. <http://liberalarts.wabash.edu/lao-5-5-debate-dialogue-empath>.
- Patricia Cook: "Essential Texts and Know Thyself," Volume 4, Number 1b, January 2004; Richard A. Lynch: "Rethinking Critical Thinking: Values and Attitudes," September 18, 2003; Larry D. Shinn: "Faith, Reason, and Know Thyself," Volume 4, Number 1a, January 2004; George Allan: "The Liberal Arts

- in the 21st Century: According to 'Change' and 'Liberal Education,'" Volume 5, Number 7, July 2005; Niall W. Slater: "Re-Inventing the Trivium. Debate, Dialogue—and Empathy," Volume 5, Number 5, May 2005.
- Lindner, Ariel B., and Francois Taddei. "Forming the next generation of European interdisciplinary scientists." <http://cri-paris.org/wp-content/uploads/Forming-interdisciplinary-scientists.pdf>.
- Lisbon Convention. "Convention on the Recognition of Qualifications concerning Higher Education in the European Region." April 11, 1997. http://www.coe.int/t/dg4/highereducation/recognition/lrc_EN.asp
- Lopes, Harris Pat. "SJSU/EdX Adds More Campuses, Courses." April 2013. <http://blogs.sjsu.edu/today/2013/sjsuedx-expansion/> (accessed July 29, 2013).
- Love, Dorian. "Flipping the Classroom." August 30, 2011. <http://www.teachersmonthly.com//index.php/2011/08/flipping-the-classroom/>.
- McCook, Alison. "Education: Rethinking PhDs." *Nature*. 2011. <http://www.nature.com/news/2011/110420/full/472280a.html>.
- Meier, Reto. "The Future of Mobile: Invisible, Connected Devices with Infinite Screens." *The Radioactive Yak*. August 9, 2010. <http://blog.radioactiveyak.com/2010/08/future-of-mobile-invisible-connected.html>.
- Mersch, Britta. "Studiengänge zu verkaufen. Auf dem Weg zur McUniversity." August 2013. www.duz.de/duz-magazin/2012/09/auf-dem-weg-zur-mcuniversity/107.
- MinervaEC. <http://www.minervaeurope.org>.
- Mod, Craig. *Post-Artifact Books and Publishing: Digital's effect on how we produce, distribute and consume content*. June 2011. http://craigmod.com/journal/post_artifact/.
- Mollett, Amy, Danielle Moran, and Patrick Dunleavy. "Using Twitter in university research, teaching and impact activities—A guide for academics and researchers." <http://blogs.lse.ac.uk/impactofsocialsciences/2011/09/29/twitter-guide/>.
- "MOOCs For Credit." October 2012. <http://www.insidehighered.com/news/2012/10/29/coursera-strikes-mooc-licensing-deal-antioch-university> (accessed July 29, 2013).
- National Center for Education Statistics. <http://nces.ed.gov/fastfacts/display.asp?id=76>.
- National Science Board. "Science and Engineering Indicators." 2010. <http://www.nsf.gov/statistics/seind10/pdf/co2.pdf>.
- Nature. "Editorial: Fix the PhD." 2011. <http://www.nature.com/nature/journal/v472/n7343/full/472259b.html>.
- New York Times online. <http://www.nytimes.com/info/wikipedia/>.
- Online Learning Consortium. <http://onlinelearningconsortium.org>
- Open Learning Initiative. <http://oli.web.cmu.edu/openlearning/initiative/team>; <http://oli.web.cmu.edu/openlearning/initiative/research/158>.

- Paul, Glade. "\$7,000 Computer Science Master's: Udacity and Georgia Tech Chop Tuition." May 2013. [www.wiredacademic.com](http://www.wiredacademic.com/2013/05/georgia-tech-udacity-to-offer-online-masters-in-computer-science-for-7000-or-less/); <http://www.wiredacademic.com/2013/05/georgia-tech-udacity-to-offer-online-masters-in-computer-science-for-7000-or-less/> (accessed July 29, 2013).
- Pew Research. <http://pewinternet.org/Reports/2010/Social-Media-and-Young-Adults/Part-3/2-Adults-and-social-networks.aspx?r=1>.
- Piazza. <https://piazza.com>
- Purdue University website. "Signals—Stoplights for Student Success." <http://www.itap.purdue.edu/tlt/signals>.
- Quora. <https://quora.com>
- Science Education for New Civic Engagements and Responsibilities (SENCER). <http://www.sencer.net>.
- SETI. <http://setiathome.berkeley.edu>.
- Shirky, Clay. "Napster, Udacity, and the Academy." *Personal Blog*. November 2013. <http://www.shirky.com/weblog/2012/11/napster-udacity-and-the-academy/>.
- Smith, Shanna, Jaggars Bailey, and Thomas Bailey. *Effectiveness of Fully Online Courses for College Students: Response to a Department of Education Meta-Analysis*. July 2010. <http://ccrc.tc.columbia.edu/Publication.asp?UID=796>.
- SSRC website. *The Immanent Frame*. February 3, 2010.
- Taylor, Mark. "Reform the PhD system or close it down." *Nature*. 2011. <http://www.nature.com/news/2011/110420/full/472261a.html>.
- Technische Universität München. <http://studiumnaturale.wzw.tum.de/index.php?id=2>.
- The Awl. "Your Massively Open Offline College Is Broken." February 2013. <http://www.theawl.com/2013/02/how-to-save-college>, <http://thenewinquiry.com/blogs/zunguzungu/tree-sitting/> (accessed July 29, 2013).
- The Chronicle of Higher Education online. 2010. <http://chronicle.com/article/Forum-Has-Online-Learnings/125117/>.
- The Economist online. "Disposable Academic: Why Doing a Ph.D is Often a Waste of Time." 2010. <http://www.economist.com/node/17723223>.
- The Economist online. "Flipping the classroom." September 17, 2011. <http://www.economist.com/node/21529062>.
- The Millennium Project of the United Nations University. <http://www.millennium-project.org/millennium/challeng.html>.
- The Yale Report of 1828. "Liberal Education and Collegiate Life." <http://collegiateway.org/reading/yale-report-1828/>.
- Thille, Candace. "Building Open Learning as a Community-based Research Activity." http://oli.cmu.edu/wp-oli/wp-content/uploads/2012/05/Thille_2008_Building_Open_Learning.pdf
- Twigg, Carol. "Can Online Education Scale?" <http://www.thencat.org/PlanRes/Online%20Ed%20Editorial.htm>.
- University College Amsterdam website. <http://www.auc.nl/acadprog>.

- Von Ahn, Luis. *Hollywood-Style Lectures*. July 2009. <http://vonahn.blogspot.de/2009/07/hollywood-style-lectures.html> (accessed July 29, 2013).
- Watters, Audrey (blog). "The Invented History of 'The Factory Model of Education'." *Hackededucation*, April 25, 2015. <http://hackededucation.com/2015/04/25/factory-model>.
- Wegmarshaus, Gert-Rüdiger. *John Dewey's Understanding of Democracy: Way of Life—Pooled Experience—Learning Process*. 2007. www.usps.parlament.org.ua.
- Wu, Jie. "Revolutionize Education Using Learning Analytics." <http://www.aboutjiewu.com/Resources/projects/INFO203/Learninganalytics.pdf>.
- Young, Jeffrey R. "Inside the Coursera Contract: How an Upstart Company Might Profit From Free Courses." July 2012. <http://chronicle.com/article/How-an-Upstart-Company-Might/133065/> (accessed July 29, 2013).
- . "Looking back at the Year in Ed Tech. *The Chronicle of Higher Education*, 2015. <http://chronicle.com/blogs/wiredcampus/author.jyoung>.
- . "Providers of Free MOOC's Now Charge Employers for Access to Student Data." December 2012. <http://chronicle.com/article/Providers-of-Free-MOOCs-Now/136117/> (accessed July 29, 2013).
- Zeppelin University. <https://www.zeppelin-university.com/research-issues/profile-projects/index.php>.

Other

- European University Association. <http://www.eua.be/eua-work-and-policy-area/research-and-innovation/doctoral-education/doc-careers-ii.aspx>.
- The National Center for Academic Transformation. <http://www.thencat.org/PlanRes/Online%20Ed%20Editorial.htm>.
- The National Center for Academic Transformation. <http://www.thencat.org/PCR/Outcomes.htm>.
- . <http://www.thencat.org/whoweare.html>.
- . http://www.thencat.org/PCR/Proj_Model.htm.
- University of the People. <http://www.uopeople.org/groups/tuition-free-education>.
- Wikipedia. http://en.wikipedia.org/wiki/Least_publishable_unit.
- . http://en.wikipedia.org/wiki/List_of_learning_management_systems.
- Wissenschaftsrates. <http://www.wissenschaftsrat.de/1/fields-of-activity/research-rating/>.
- Word Origins. www.wordorigins.org.
- Zeppelin Universität. <http://www.zu.de/deutsch/bewerberportal/bachelor/2010/bachelorprogram.php>.

Conference Materials, Essays, Reports, Speeches

- Allen, I. Elaine, and Jeff Seaman. "Changing Course: Ten Years of Tracking Online Education in the United States." Babson Survey Research Group and Quahog Research Group, 2013.
- American Association of Colleges and Universities. "College Learning for the New Global Century." 2007.
- Board of Trustees of the Leland Stanford Junior University. "The Study of Undergraduate Education at Stanford University." 2012.
- Campus Computing Project. "The 2010 Managing Online Education Survey, WCET." 12 November 2010.
- A World without Universities?* Performed by Gerhard Casper. July 3, 1996.
- Coleman, Elisabeth. *The Bennington Curriculum: A New Liberal Arts*. October 6, 2007.
- Enhancing Learning: the Aberdeen Approach—The Final Report of the Curriculum Commission*. October 10, 2008.
- Figlio, David N., Mark Rush, and Lu Yin. "Is it Live or is it Internet? Experimental Estimates of the Effects of Online Instruction on Student Learning." NBER Working Paper No. 16089, June 2010 .
- Fosse, Ethan, and Neil Gross. "Why are Professors Liberal?" Working Paper, 15 January 2010.
- Gerhardt, Volker. "Humboldts Idee: zur Aktualität des Programms Wilhelm von Humboldts." In *Humboldts Zukunft: das Projekt Reformuniversität*, edited by Bernd Henningsen, 55–75. Berlin, 2007.
- Kennedy, John F. "Inaugural Address." January 20, 1961.
- King, Martin Luther. "I have a dream." Speech, 28 August 1963.
- Kurfiss, Joanne Gainen. "Critical Thinking: Theory, Research, Practice and Possibilities." Higher Education Report, No 2, Washington D.C., 1988.
- Laubichler, M., et al. "An Honors College Worth Its Name."
- Massachusetts Institute of Technology, press release, April 4, 2001. "MIT to Make Nearly All Course Materials Available Free on the World Wide Web."
- McGonigal, Jane. "Gaming Can Make a Better World." Presentation at TED2010, February 2010.
- Offe, Claus. "Do Western Universities have a Mission?" Working papers, No. 20, Hertie School of Governance, April 2008.
- Pollok, Sheldon. "Disciplines, Areas, Postdisciplines." April 2008.
- Sen, Amartya. "Democracy as a Universal Value." Keynote address, Global conference on democracy. New Delhi, 14 February 1999.
- Shulman, Lee. "Curriculum Deliberations for Bologna II: What Kinds of Knowledge, in What Form and Taught by Whom." 2008.
- Sloan Consortium. "Class Differences: Online Education in the United States." Survey, November 2010.

- Sloan Consortium, survey. "Online Report Card: Tracking Online Education in the United States." 2015.
- . "Grade Change: Tracking Online Education in the United States." 2013.
- . "Class Differences: Tracking Online Education in the United States." 2010.
- . "Learning on Demand: Tracking Online Education in the United States." 2009.
- . "Sizing the Opportunity: The Quality and Extent of Online Education in the United States." 2002.
- Social media and research workflow. "CIBER." University College London Emerald Group Publishing Ltd, 14 December 2010, 2.
- The 2011 Horizon Report. "The New Media Consortium." 2011.
- university of Aberdeen. "Enchancing Learning: the Aberdeen Approach—The Final Report of the Curriculum Commission. October 10, 2008.
- University of Texas at Austin. "Social Media Actually Strengthen Social Ties, Various Demographics Engage Differently, Study Says." Press release, November 22 2010.
- US Department of Education. "Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies."
- . "National Educational Technology Plan." 2010.
- Waits, S. Craig, and H. Erin Lee. "Got Facebook? Investigating What's Social About Social Media." Study, November 18 2010.
- Wegmarshaus, Gert-Rüdiger. "John Dewey's Understanding of Democracy: Way of Life—Pooled Experience—Learning Process." <http://www.usps.org.ua/uploads/docs/Democracy.pdf>.
- Wiley, David. Lecture at the TEDxNYED, 6 March 2010.
- Wissenschaftsrat. "Empfehlungen zur Rolle der Fachhochschulen im Hochschulsystem." Berlin, 2 July 2010.
- Wissenschaftsrat. "Emphelungen zur Differenzierung der Hochschulen." Lübeck, 2010.
- Woolf, Virginia. "Montaigne." In *The Common Reader*, 84–97. The Hogarth Press, 1925/1975.
- Zielonka, Jan. "Is the European Union a Neo-Medieval Empire?" Paper no. 1, Maastricht: The Cicero Foundation, available from http://www.cicerofoundation.org/lectures/Jan_Zielonka_The_EU_Neo-Medieval_Empire.pdf. 2008.

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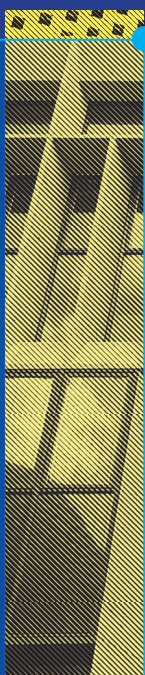
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